

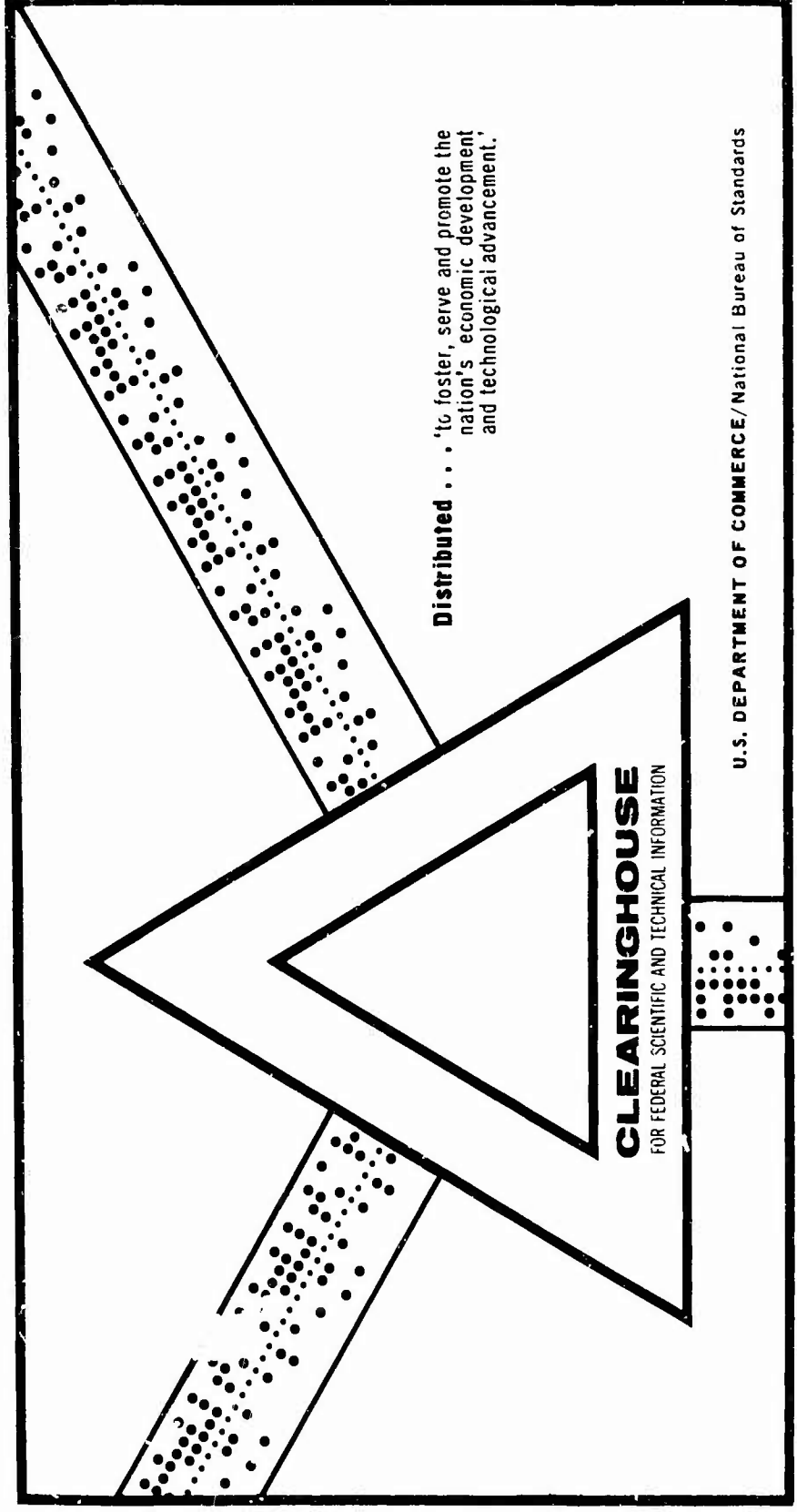
AD 701 934

DISASTER AND ORGANIZATIONAL CHANGE. A STUDY OF THE LONG-TERM
CONSEQUENCES IN ANCHORAGE OF THE 1964 ALASKA EARTHQUAKE

William A. Anderson

Ohio State University
Columbus, Ohio

September 1969



This document has been approved for public release and sale.

DISASTER RESEARCH CENTER SERIES

DISASTER AND ORGANIZATIONAL CHANGE:

A STUDY OF THE LONG-TERM CONSEQUENCES IN ANCHORAGE
OF THE 1964 ALASKA EARTHQUAKE

WILLIAM A. ANDERSON

AD 701934



DC
R 9 1970
C

DISASTER RESEARCH CENTER

•

THE OHIO STATE UNIVERSITY

CONTRACT OCD-PS-64-46 • WORK UNIT 2651-A • This document has been approved for public release and sale • its distribution is unlimited

104

Disaster Research Center Monograph Series
No. 6

DISASTER AND ORGANIZATIONAL CHANGE: A STUDY
OF THE LONG-TERM CONSEQUENCES IN
ANCHORAGE OF THE 1964 ALASKA EARTHQUAKE

by

William A. Anderson
Department of Sociology
Arizona State University

for

Office of Civil Defense
Office of the Secretary of the Army
Washington, D.C. 20310

September 1969

OCD REVIEW NOTICE

This report has been reviewed in the Office of Civil Defense and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Office of Civil Defense.

CONTRACT OCD-PS-64-46

WORK UNIT 2651-A

THIS DOCUMENT HAS BEEN APPROVED FOR PUBLIC
RELEASE AND SALE; ITS DISTRIBUTION IS UNLIMITED

DISASTER AND ORGANIZATIONAL CHANGE: A STUDY
OF THE LONG-TERM CONSEQUENCES IN
ANCHORAGE OF THE 1964 ALASKA EARTHQUAKE

William A. Anderson

Abstract

This monograph discusses the findings of a year and a half field study on the long-term effects of the March 27, 1964 Alaska earthquake on a sample of twenty-three Anchorage organizations. Seventeen of the organizations studied experienced some long-term change as a result of the earthquake. In some cases the disaster facilitated the emergence of new patterns of change and in others it accelerated pre-existing trends. Organizations tended to undergo long-term change when the earthquake significantly altered their environments, for example, by creating new demands, and when it engendered or heightened internal problems such as organizational strains.

FOREWORD

This document is one of a series of publications prepared by the staff of the Disaster Research Center, The Ohio State University. This aspect of the work of the Center has been sponsored by the Office of Civil Defense under Contract OCD-PS-64-46 Work Unit 2651-A. Below is a listing of the materials which have been included in the monograph and the report series.

Monograph Series

Thomas E. Drabek, Disaster in Aisle 13: A Case Study of the Coliseum Explosion at the Indiana State Fairgrounds, October 31, 1963

Russell R. Dynes, Organized Behavior in Disaster: Analysis and Conceptualization

Daniel Yutzy with William A. Anderson and Russell R. Dynes, Bad Good Friday: Community Priorities in the Anchorage, Alaska Earthquake 1964

William A. Anderson, Disaster and Organizational Change: A Study of the Long-Range Consequences in Anchorage of the 1964 Alaskan Earthquake

David S. Adams, Emergency Actions and Disaster Reactions: An Analysis of the Anchorage Public Works Department in the 1964 Alaska Earthquake

Report Series

(Authored by various members of the Disaster Research Center staff)

The Functioning of Established Organizations in Community Disasters

The Functioning of Expanding Organizations in Community Disasters

Military-Civilian Relations in Disaster Operations

Community Functions Under Disaster Conditions

The Warning Process in Disaster Situations

The Police Department in Disaster Operations

The Fire Department in Disaster Operations

The Department of Public Works: A Community Emergency Organization

The Functioning of Civil Defense in Community Disasters

Salvation Army Activity in Disasters

The Local American Red Cross: Programs, Policies and Problems

The Los Angeles Fire Department Operations During Watts

CONTENTS

FOREWORD	ii
ILLUSTRATIONS	v
TABLES	vi
PREFACE	vii
ACKNOWLEDGMENTS	viii
Chapter	
I. INTRODUCTION	1
The Scope of the Study	
Past Studies	
General Theoretical Framework	
The Organizations Studied	
II. THE DISASTER RESPONSE	11
The Setting	
The State	
Anchorage	
The Disaster	
The Disaster Response	
The Emergency Period	
Search and Rescue	
Medical and Health Organizations	
Security and Control	
Commercial Radio	
Utilities	
Service and Welfare Organizations	
Civil Defense	
Rehabilitation Period	
Federal Aid	
Organizational Interaction	
III. LONG-TERM ORGANIZATIONAL CHANGES	25
Change and the Conditions for Change	
Anchorage City Government	
New Patterns of Change Initiated by Internal Conditions	
Anchorage Police Department	
Alaska Native Hospital	
Providence Hospital	
Alaska National Guard	
Anchorage Natural Gas Corporation	
Alaska Salvation Army	
Anchorage Daily Times	
New Patterns of Change Initiated by External Conditions	
City of Anchorage Fire Department	

- New Patterns of Change Initiated by a Combination of Internal and External Conditions
 - Anchorage Civil Defense
 - Red Cross South Central Alaska Chapter
- Preexisting Patterns of Change Accelerated by Internal Conditions
 - Anchorage Municipal Light and Power Department
- Preexisting Patterns of Change Accelerated by External Conditions
 - KBYR Radio
 - Northern Television, Inc.
- New Patterns of Change Initiated and Preexisting Patterns Accelerated by Internal Conditions
 - Chugach Electric Association
- New Patterns of Change Initiated and Preexisting Patterns Accelerated by External Conditions
 - Anchorage Port Department
- New Patterns of Change Initiated and Preexisting Patterns Accelerated by Both Internal and External Conditions
 - State of Alaska Civil Defense
 - Anchorage Public Works Department
- Organizations in Which No Observable Disaster Related Long-term Change Occurred
 - KHAR Radio
 - KENI Radio and Television
 - KFQD Radio
 - Anchorage Telephone Department
 - Presbyterian Community Hospital
 - Anchorage Independent School District
- Summary of Findings

IV. INTERPRETATION AND CONCLUSIONS	76
Disaster and Its Social Consequences	
Internal and External Conditions Related to Long-term Organizational Change	
Internal Conditions: Organizational Learning	
Internal Conditions: Organizational Strain	
External Conditions: New Demands	
External Conditions: Increased Support	
Infrequency of Retardation of Organizational Change	
The Absence of More Long-term Change	
Absence of Significant Environmental and Internal Impact	
Low Priority of Needed Changes	
Concluding Observations	

APPENDIX	84
--------------------	----

ILLUSTRATIONS

Figure	Page
1. City of Anchorage	28
2. Anchorage Police Department	30
3. Providence Hospital	34
4. Anchorage Fire Department	38
5. Anchorage Municipal Light and Power Department	46
6. Anchorage Public Works Department	62

TABLES

Table	Page
1. Disaster Conditions and Their Consequences	26
2. Port of Anchorage Tonnage Figures	51

PREFACE

Some of the monographs in the series published by the Disaster Research Center (DRC) present theoretical discussions of short-run organizational responses to community crises. Others of the monographs deal with general topics such as warning problems in large-scale emergencies. Still others in the series are primarily descriptive accounts of specific disasters. This particular monograph reports yet another kind of research undertaking. It is a longitudinal study of organizational change over an eighteen-month period.

The monograph examines, within a sociological framework, the changes that occurred as a result of the Alaskan earthquake in the structure and functions of twenty-three organizations in Anchorage, Alaska. It attempts to answer the question of what were the long-run modifications that could be attributed to the experiences of these organizations in the disaster. In one respect, it asks what kind of "organizational learning" took place. The author also makes an effort to account for the conditions and contexts that led some of the groups to alter themselves significantly whereas others remained as they were before the earthquake.

In the main, what is impressive is the relative lack of organizational change that took place. Such long-run modifications in structure and functions that occurred were highly selective, and often the continuation of already existing trends. The following account is a testimony to the remarkable stability of social life and suggests that while change is ever present it is not likely to be significantly accelerated or drastically reoriented in different directions even by a major disaster. Whether this general observation stems from some unique or particular constellation of factors in the Alaskan earthquake, or whether it is a more universal finding, will have to await examination of other disaster situations. At this point, the author has provided a very good starting point for future studies.

Russell R. Dynes
E. L. Quarantelli
Co-Directors
Disaster Research Center

ACKNOWLEDGMENTS

In completing this monograph I am indebted to many persons. Drs. Russell R. Dynes and E. L. Quarantelli, co-directors of the Disaster Research Center, provided me with many valuable suggestions for conducting the research and writing the monograph. Dr. J. Eugene Haas, who was a co-director at the Center when this study was being made and who is now at the University of Colorado, also gave me valuable advice. Elaine Hobart, Mel Boggins and Barbara Tootle assisted in editing the manuscript.

Several persons were on one or more of the data-gathering trips to Anchorage. In addition to the present co-directors and Dr. Haas, this included the late Dr. James R. Hundley, Jr. and Dr. Daniel Yutzy of the State University of New York.

Finally, I am deeply indebted to the many organizational officials in Anchorage who cooperated with us during the research. They shared their dramatic experiences with us so that we could learn more about human behavior.

CHAPTER I

INTRODUCTION

The Scope of the Study

A major earthquake struck southcentral Alaska -- including Anchorage, the state's largest community -- on March 27, 1964. Many organizations, large and small, were involved in the response to that disaster. Some of these groups had to change their behavior considerably in their attempts to cope with the emergency. In this study we examine what, if any, long-term changes or adaptations occurred in a number of these organizations. We conducted this examination by making a series of case studies of Anchorage based organizations.

The following questions particularly interested us: (1) What long-term organizational changes related to the disaster occurred after the earthquake? In other words, we sought a description of the long-run consequences of the disaster for certain organizations. (2) What was the nature of such modifications? For example, had they been anticipated prior to the earthquake? (3) How can we best account for the observed changes? We wanted to analyze the factors that were responsible for such alterations in the organizations. And finally, (4) How can the absence of organizational change in some instances be explained? That is, given the circumstances, why was there no observable change in particular cases?

Our overall intent is to provide needed information about social change by considering the relationship between one type, long-term organizational change, and community disaster. Sociologists generally agree that the study of social change, which should be one of the discipline's primary concerns, is among its least developed and understood areas.¹ Organizational change has been as equally poorly studied.²

In the area of disaster research, there is a slowly growing body of empirical data on the immediate and usually temporary adjustments of communities, organizations, and individuals to stressful or disaster conditions.³ In these studies, the assumption has been that the forms such adjustments will take are, at least in part, patterned. Thus, through systematic observation, regularities can be identified and generalizations from one disaster situation to another can be made.

However, the vast proportion of this research has dealt with a very restricted time span -- the immediate emergency period of perhaps a week at the most. Few researchers have considered in an equally systematic fashion the long-term social change produced by disaster. We feel that this is a research problem with at least as much importance and implication, and present this study as a contribution to the development of the area.

Past Studies

Even in the relatively few disaster studies that do discuss long-run changes, the topic seldom occupies a prominent place. Some of the researchers have had but tangential interest in the topic and make references only in passing. Still other researchers developed an interest only after they had collected their data and thus had little to report in their analyses. Few of these studies report on organizational changes with only one -- Drabek's study of the Indiana Coliseum explosion⁴ -- specifically addressing itself to this level of analysis. Despite these limitations, however, this kind of research does have some relevance for our interests.

Some past studies present findings which indicate that long-term change often does occur in a community or society that experiences a major disaster.⁵ For example, Samuel Prince in his 1920 study of the Halifax explosion notes changes in community health organizations, recreation, education, and relations among various voluntary organizations.⁶ J. E. Ellemers reports that after the Holland flood disaster, "the establishment of new institutions such as social welfare, community centers and a beginning of community-organization constituted . . . elements of change introduced by the restoration."⁷ Bates et al., in their longitudinal study of the social and psychological consequences of Hurricane Audrey, identify several long-run modifications and alterations which occurred in Cameron Parish, Louisiana. For example, there were changes in public services, in key community offices, and in the creation of new public positions and new organizations.⁸ In Weisman's study of a Norwalk, Connecticut flood, he observed the creation of new agencies and commissions and a greater awareness on the part of officials of various kinds of community problems.⁹

Sometimes there are also technological adjustments after a disaster. Drabek indicates that the coliseum explosion was followed by a number of changes in organizational communications systems. For example, an inter-hospital radio telephone system was established in Indianapolis as a direct result of the disaster. Steps were also taken to improve police communication capabilities.¹⁰

Usually, sociological and technological change are inextricably bound, as this excerpt from Ellemers' Holland study illustrates.

Finally, we wish to mention one change in particular, namely the radical change in the warning- and safety-systems in the south-western Netherlands. Through the cooperation of the meteorological stations, the Ministry of Waterways and Transport, polder organizations and municipalities, an extensive warning-system has been established. By means of this system, people are better informed about high water levels and dangerous situations and are better prepared for them. On the basis of existing organizations -- polders, Red Cross, Civil Defense and others -- an organization has been set up for the protection of the dykes, for relief, rescue and evacuation in case of emergencies.¹¹

The findings from many of the studies also suggest that a community or society stricken by a disaster may become more susceptible to change. For example, Fritz makes this observation:

Disaster provides an unstructured social situation that enables persons and groups to perceive the possibility of introducing desired innovations into the social system. . . . The breaking of the "cake of custom" is often perceived by many groups in the society as desirable once the immediate problems of rescue, medical care, subsistence, and shelter become solved. Changes and adjustments made during the emergency give proof that the restructuring or changing of the social system is possible. People see the opportunity of realizing certain wishes which remained latent and unrealized under the old system.¹²

The findings of Prince and Ellemers would also support this view.

One generalization appearing in many of the studies is that disasters function as catalysts, i.e., they result in the acceleration of pre-disaster patterns of social change.¹³ Prince reports that some impending decisions regarding city planning and civic improvements in Halifax occurred earlier than anticipated because of the explosion.¹⁴ Ellemers says that following the Holland flood, "the most important tendency seems to be the acceleration of an already existing process of social change."¹⁵ Bates et al. also report that pre-disaster trends or processes were accelerated following Hurricane Audrey. In one instance, the disaster was responsible for increasing an already existing tendency toward increased formalization in social relations in Cameron Parish.¹⁶

Thus, such studies as do exist indicate that change does indeed result from a community-wide disaster. An explanation suggested is that increased fluidity in the structure of a social system following a disaster makes it responsive to the introduction of new social organizational and technological patterns. There is also some evidence that disasters function as catalysts and are responsible for accelerating pre-disaster patterns of change.

General Theoretical Framework

There is relatively little agreement on key terms in the disaster literature.¹⁷ Nor is there complete consensus on major sociological concepts. Thus, before indicating our general theoretical framework, it will be necessary to indicate how we conceptualize some of the major terms we will be using.

Our definition of disaster follows that of Marks and Fritz who conceive of it as having these characteristics:

- a. The event affects a community of persons -- i.e., a collection of people who occupy a common territory and are bound together in relatively permanent social relationships.

- b. The event confronts a large segment of the community with actual danger, or threats of danger and loss to cherished values and material objects.
- c. The event results in deaths, injuries, the destruction of property, and other losses and deprivations to the population, e.g., the disruption of community utilities and other community services.
- d. The direct or indirect consequences of the disaster affect a large proportion of the population in the community -- i.e., the repercussions are diffused throughout the community rather than focalized in a particular group or collection of individuals.¹⁸

For the purpose of this study, we view an organization as having several characteristics which distinguish it from other collections of people. For example, it is relatively permanent, and complex in the sense that the group tends to have several distinct levels of positions. Also, it has patterned interaction -- i.e., certain interaction sequences are repeated.¹⁹ These patterns may be internal, e.g., relationships between positions and units within an organization. Or they may be external, such as relationships between an organization and its environment, e.g., other organizations.

With this definition in mind, we define organizational change as any modification in the patterned interaction of an organization. Long-term organizational change refers to modifications in organizational patterns which appear to have become relatively durable features. Durability is difficult to define but has reference to what sociologists generally call institutionalization.

Our approach to the relationship between disaster and organizational change is to regard organizations as dilemma-solving and tension-managing social systems.²⁰ From this perspective, internal and external problems are viewed as providing impetus to both short-run and long-term organizational change. Consequently, in this study the basis for such change was sought in both the internal and external relationships and processes of organizations.

Our orientation evolved from the findings of several other behavioral researchers. One was Wilbert Moore, who notes with regard to internal organizational characteristics and problems:

Some organizational changes . . . represent the gradual transformation of the organization in response to its own characteristics and its adjustment to relatively stable environments. Some persistent problems of organization, for example, though never fully "solved," provide the basis for the continuous quest for further approximations to perfection.²¹

In other studies, the following related points are brought out. Many changes which occur in organizations in response to internal problems are official. That is, the modifications or innovations are initiated by officials who have the legitimate authority to do so.²² However, other changes

are unofficial, such as those resulting from worker-management²³ or staff-line problems.²⁴ Organizations may also change as they attempt to adjust to problems originating from their environments.²⁵

Organizations conceived of as problem-solving systems are never in a state of perfect equilibrium or adjustment. They are always faced with difficulties of varying degrees of seriousness which require attention. In the process of adjusting to their problems, organizations take on new characteristics which become long-term organizational features.

Thus in our research effort, viewing organizations as problem-solving systems sensitized us to the possibility of change occurring from problems which were a direct result of the earthquake or from pre-disaster problems that somehow took on new significance because of it. For example, frequently during a major community disaster, organizations find it difficult to coordinate and control rescue, relief, and rehabilitation activities. Several problems are often responsible for this. These include the lack of a clear-cut division of labor among different organizations, ambiguity as to which officials and organizations have the authority for various decisions, and inadequate communications within and between organizations.²⁶

Our orientation prepared us to be alert to the following possibilities resulting from such situations: (1) As these and similar problems became apparent during the crisis they may have served as a basis for temporary organizational modifications. (2) Such disaster related problems may have generated long-term organizational change as organizations established plans and procedures to prevent their recurrence or to minimize their effect in future disasters.

As previously mentioned, there have been very few studies on the long-term social consequences of disaster and even fewer in which organizations were the units of analysis. Consequently, relevant variables have not been systematically identified. In utilizing our framework, it is our intention to provide rich descriptive data upon which more analytical studies can be built, and to identify some of the variables that might account for long-term organizational change following disaster.

A number of sociologists have suggested that the notions of social conflict and strain are relevant variables in the analysis of social change. With this in mind, these notions were examined in our research to determine their utility as analytical variables in explaining disaster related long-term organizational adaptation. In terms of our general approach we were interested in organizational strain as a type of internal organizational problem, and interorganizational conflict as an environmental problem.

Strain is what Parsons refers to as an endogenous source of structural change.²⁷ In organizations it is the inconsistencies or discrepancies between structural elements, e.g., between official and unofficial structures. Other types of organizational strain include role conflict -- when an individual is faced with conflicting expectations; and normative dissensus -- for example,

when two departments disagree about the legitimacy and priority of certain demands.²⁸ Among others, Moore and Feldman utilize the notion of persistent strain as a probable reason for change in social systems.²⁹ This lack of harmony in organizations, for example, creates problems and as Moore indicates,

Problems provoke attempted solutions. Individuals seek to further their interests, or, very commonly, the interests of organizational units they represent, and in doing so attempt to find new procedures, new distribution of power, influence, prestige and wealth. The divisive influences, however, need not dominate. Some problem-solving will be directed toward alleviating tension or removing strains, and will lead to compromise or to authoritative and disciplined decisions.³⁰

Conflict is another variable used to account for social change. Coser, for example, sees "the clash of values and interests, the tension between what is and what some groups feel ought to be, the conflict between vested interests . . ." as being responsible for generating new norms, institutions, and economic and technological changes in a society.³¹ In this study, we are using the term in what La Piere refers to as its general and most frequently used sense.³² Thus, conflict may be used to refer to less dramatic situations such as disagreement between relief organizations over who has the right to feed disaster victims.

We will seek to make an assessment, then, of the usefulness of the variables of organizational strain and interorganizational conflict in terms of our particular research problem. More specifically, we want to determine if, following a disaster, (1) long-term organizational change occurs in sources of pre-disaster and disaster-generated organizational strains, and if (2) long-term organizational change occurs in pre-disaster and disaster-generated conflict relations between organizations.

The Organizations Studied

The following sample of twenty-three organizations was selected for the study. (The basis for drawing the sample and the methodology of the study are discussed in the appendix.)

Anchorage Police Department
Anchorage Civil Defense Department
Anchorage Fire Department
Anchorage Port Department
Anchorage School District
Anchorage Public Works Department
Anchorage Municipal Light and Power Department
Anchorage Telephone Department
Alaska Native Hospital
Two private hospitals
One radio-television station

Three radio stations
One television station
Anchorage Daily Times
Chugach Electric Association
Anchorage Natural Gas Corporation
South Central Alaska Chapter, American Red Cross
Alaska Salvation Army
Alaska National Guard
Alaska State Civil Defense

Besides varying in their disaster involvement, these organizations also range along several structural dimensions. Included in the sample are: (1) large, highly bureaucraticized organizations and smaller, less bureaucratic ones; (2) organizations with large numbers of volunteers and those with few or no such personnel; (3) organizations whose normal function is to deal with emergency situations and those that never become so involved; and (4) local and state organizations. The disaster roles of these organizations will be considered in the next chapter.

Having specified the research problem, made a general theoretical statement, and defined key concepts, in the next chapter we will turn to a discussion of the disaster setting and the response made to the disaster during the emergency and rehabilitation periods.

NOTES: Chapter I

1. W. E. Moore, The Conduct of the Corporation (New York: Random House, 1962), p. 191.
2. Amitai Etzioni, Complex Organizations: A Sociological Reader (Holt, Rinehart and Winston, 1961), p. 341; Peter Blau and W. Richard Scott, Formal Organizations (San Francisco: Chandler, 1962), p. 223. Among the few significant empirical studies have been: Alvin W. Gouldner, Patterns of Industrial Bureaucracy (Glencoe, Ill.: The Free Press, 1954); Robert H. Guest, Organizational Change: The Effect of Successful Leadership (Homewood, Ill.: Dorsey-Irwin Press, 1962); Philip Selznick, TVA and the Grass Roots: A Study in the Sociology of Formal Organizations (Berkeley: University of California Press, 1949); and Peter M. Blau, The Dynamics of Bureaucracy (Chicago: University of Chicago Press, 1955).
3. For an excellent summary of much of this research, see Allen H. Barton, Communities in Disaster: A Sociological Analysis of Collective Stress Situations (Garden City, N.Y.: Doubleday and Company, 1969).
4. Thomas E. Drabek, Disaster in Aisle 13: A Case Study of the Coliseum Explosion at the Indiana State Fairgrounds, October 31, 1963, Disaster Research Center Monograph Series (Columbus: College of Administrative Science, The Ohio State University, 1968).
5. The fact that change often occurs in communities or societies which have undergone a catastrophe has led one sociologist to state the following proposition: "Our prime contention is that disasters are a key variable in altering the social structure of industrial-urban societies." Gideon Sjoberg, "Disasters and Social Change," in Man and Society in Disaster, ed. by George Baker and Dwight Chapman (New York: Basic Books, 1962), p. 356.
6. Samuel H. Prince, Catastrophe and Social Change, Columbia University Studies in History, Economics, and Public Law, Vol. 94 (New York: Longmans, Green and Company, 1920), pp. 118-140.
7. J. E. Ellemers, Studies in Holland Flood Disaster, 1953 (Washington: National Academy of Sciences-National Research Council, 1955), 4:59.
8. F. L. Bates, C. W. Fogelman, V. J. Parenton, R. H. Pittman, and G. S. Tracy, The Social and Psychological Consequences of a Natural Disaster: A Longitudinal Study of Hurricane Audrey (Washington: National Academy of Sciences-National Research Council, 1963), pp. 121-125. See also Charles W. Fogelman and Vernon J. Parenton, "Disaster and Aftermath: Selected Aspects of Individual and Group Behavior in Critical Situations," Social Forces 38 (December 1959): 134-135.

9. Seymour S. Weisman, Case Study of a Flood-Stricken City (New York: Colby Printers, 1958).
10. Drabek, Disaster in Aisle 13, p. 129.
11. Ellemers, Holland Flood Disaster, p. 66.
12. Charles E. Fritz, "Disaster," in Contemporary Social Problems: An Introduction to the Sociology of Deviant Behavior and Social Disorganization, ed. by Robert K. Merton and Robert A. Nisbet (New York: Harcourt, Brace and World, 1961), p. 685.
13. Sjoberg, "Disasters and Social Change," p. 373.
14. Prince, Catastrophe and Social Change, p. 130.
15. Ellemers, Holland Flood Disaster, p. 60.
16. Bates et al., Social and Psychological Consequences, pp. 130-131.
17. Russell R. Dynes, Organized Behavior in Disaster: Analysis and Conceptualization, Disaster Research Center Monograph Series (Columbus: Disaster Research Center, The Ohio State University, 1969).
18. E. S. Marks, C. E. Fritz et al., "Human Reactions in Disaster Situations" (Unpublished report, National Opinion Research Center, The University of Chicago, 1954), pp. 2-3.
19. This definition was derived from the work of J. Eugene Haas in Role Conception and Group Consensus (Columbus: Bureau of Business Research, The Ohio State University, 1964), pp. 25-31.
20. Our approach follows rather closely that suggested by Wilbert Moore and Blau and Scott. See, for example, Wilbert Moore, Social Change (Englewood Cliffs, N. J.: Prentice-Hall, 1963); Wilbert Moore and Arnold S. Feldman, "Society as a Tension-Management System," in Behavioral Science and Civil Defense, ed. by George W. Baker and Leonard S. Cottrell, Jr. (Washington: National Academy of Sciences-National Research Council, 1962); and Blau and Scott, Formal Organizations.
21. Moore, Conduct of the Corporation, p. 193.
22. See Theodore Caplow, Principles of Organization (New York: Harcourt, Brace and World, 1964), pp. 232-234, who notes that such changes often occur in industrial organizations as officials make certain structural adjustments aimed at increasing production levels.
23. F. J. Roethlisberger and W. J. Dickson, Management and the Worker (Cambridge, Mass.: Harvard University Press, 1941).
24. Melville Dalton, Men Who Manage (New York: Wiley and Sons, 1959).

25. Selznick, TVA and the Grass Roots; Burton R. Clark, "Organizational Adaptation and Precarious Values: A Case Study," American Sociological Review 21 (1956).
 26. Charles E. Fritz and Harry B. Williams, "The Human Being in Disasters: A Research Perspective," The Annals of the American Academy of Political and Social Sciences 309 (January 1957): 47.
 27. Talcott Parsons, "An Outline of the Social System," in Theories of Society: Foundations of Modern Sociological Theory, ed. by Talcott Parsons, Edward Shils, Kasper D. Naegle, and Jesse R. Pitts (New York: The Free Press of Glencoe, 1962), 1:71. Parsons conceives of strain as follows:
 Strain here refers to a condition in the relation between two or more structured units (i.e., subsystems of the system) that constitutes a tendency or pressure toward changing that relation to one incompatible with the equilibrium of the relevant part of the system. If the strain becomes great enough, the mechanisms of control will not be able to maintain that conformity to relevant normative expectations necessary to avoid the breakdown of the structure. A strain is a tendency to disequilibrium in the input-output balance between two or more units of the system.
- Merton makes this important observation regarding the notion of strain:
 The key concept bridging the gap between statics and dynamics in functional theory is that of strain, tension, contradiction, or discrepancy between the component elements of social and cultural structure. Such strains may be dysfunctional for the social system in its then existing form; they may also be instrumental in leading to change in that system. In any case, they exert pressure for change. When social mechanisms for controlling them are operating effectively, these strains are kept within such bounds as to limit change of the social structure.
- Robert K. Merton, Social Theory and Social Structure, 2d ed. rev. (New York: The Free Press of Glencoe, 1963), p. 122.
28. Thomas E. Drabek, J. Eugene Haas, E. L. Quarantelli, and Russell R. Dynes, "A Theory of Organizational Stress" (Paper presented at the annual meeting of the American Association for the Advancement of Science, Montreal, December 28, 1964).
 29. Moore and Feldman, "Tension-Management System," p. 96.
 30. Moore, Social Change, p. 58.
 31. See Lewis A. Coser, "Social Conflict and the Theory of Social Change," The British Journal of Sociology 8 (September 1957): 197-198.
 32. Richard T. La Piere, Social Change (New York: McGraw-Hill Book Company, 1965), pp. 477-481.

CHAPTER II

THE DISASTER RESPONSE

The Setting

The State

Alaska, with 586,000 square miles, is by far the largest state in terms of area. Its population in 1960 was 226,000, of whom 43,000 were classified as native, i.e., Indian, Eskimo, and Aleut.

The population tended to be concentrated around a few main urban areas. Almost half of the people lived in the southcentral region, which was struck by the earthquake and the subsequent seismic waves.¹ This region includes Anchorage, Kodiak, Seward, Valdez, Whittier, and Kenai. Of the 100,000 persons who reside in the Anchorage metropolitan area, about 50,000 lived within the city's corporate limits. The combined population of the other communities in the southcentral region was less than 10,000.²

Several industries had grown up around the natural resources of the state to become important aspects of its economic structure including fishing, mining, and lumbering.³ After 1957, oil refining and natural gas production also became important; much of this activity was carried out in the Kenai Peninsula area to the south of Anchorage where several companies had constructed refineries.

Transportation was not very adequate in Alaska due in large measure to climatic and other geographic factors. The best highways were centered around Anchorage and Fairbanks, the two largest cities. Also, rail transportation facilities were so located as to provide service mainly between Fairbanks and the southcentral region. Shipping and aviation played important roles in the transportation system of the state. High bulk products were shipped from states such as Washington to southcentral Alaska and then transported inland by The Alaska Railroad. Also, the inadequacy of the highway system had led to considerable dependence on aviation as a mode of travel throughout the state's interior.

The military played a vital role in the economy of Alaska. Many civilians were employed by the military and the income of military personnel supported many of the state's service industries. Even large numbers of persons who were not directly employed by the military or federal government, e.g., people working in the construction industry, depended to some extent on federal defense spending for some income.

Anchorage

The Anchorage metropolitan area was the economic and trade center of the state.

Approximately 40% of Alaska's income, or about \$252 million, is derived from the Anchorage area. Not being a major manufacturing center, Anchorage achieves its importance as the central transportation, communications and logistics support point with more than 2,000 persons employed in transportation and more than 500 in communications and electronics. It is also the headquarters for oil and gas explorations in Alaska and the focal point for this industry's management supply and support.⁴

The kinds of organizations and groups located in Anchorage at the time of the disaster certainly bore some relationship to the fact that it was the financial and population center of the state. Many of the organizations which possessed important resources that were used during the emergency would not have been found in smaller communities in Alaska, or would not have had the same kind of capabilities. For example, compared to most communities, Anchorage had relatively large and modern police and fire departments. Several state and federal agencies had offices in the community, e.g., state civil defense and the Corps of Engineers. Such organizations could provide Anchorage with speedy access to state and federal resources. Fort Richardson and Elmendorf Air Force Base, with their vast resources, were located just outside the city. About 25,000 military personnel resided in the area.⁵

The military played a very important role in the Anchorage area's economic structure, but it was interwoven with civilian organizations in more than an economic sense. The children of military personnel attended the public schools. The wives taught in Anchorage schools, worked as nurses in the hospitals, and served as secretaries in various organizations and agencies. The military and civilian organizations frequently cooperated with one another. For example, Anchorage area fire departments had mutual aid agreements with their military counterparts.

Furthermore, some military personnel retired and became employed in important positions in Anchorage. Their prior relationships in the military and their knowledge of its operation enabled them to act as effective liaison persons between the two elements of the community. Thus, a basis for cooperation existed between the military and civilian spheres of the community which could be drawn upon during a period of emergency.

There was considerable change occurring in the community at the time of the earthquake. In essence, it was becoming more urbanized. Between 1950 and 1960, the city's population expanded from 11,254 to 44,237.⁶ Although population growth seemed to have leveled off considerably after 1960, substantial expansion and development was still required of its institutions and organizations at the time of the disaster. For example, there was a new hospital and also one that only recently had expanded. There was a new gas

utility and the school system was in the process of expanding and undergoing other changes.

The Disaster

The Alaska earthquake occurred on Good Friday, March 27, 1964 at 5:36 p.m. It registered on the Richter scale at between 8.4 and 8.7 and thus was one of the most powerful earthquakes to be recorded in the United States.⁷ The epicenter of the earthquake was in Prince William Sound in the southcentral part of the state.⁸ Property damage estimated at over \$300 million⁹ occurred in southcentral Alaska over an area of about 50,000 square miles;¹⁰ 116 persons died. The uplift and subsidence of the earth and the subsequent seismic waves caused most of the damage and deaths. A number of communities were affected, including Anchorage, Seward, Valdez, Kodiak, Homer, and Whittier.

Anchorage, which was approximately 30 miles west of the epicenter received the most property damage,¹¹ but had only nine deaths. Seismic shock and landslides rather than seismic waves accounted for the damage in Anchorage.

Much of the city's damage was the result of four major landslides triggered by the earthquake: Fourth Avenue, L Street, Government Hill, and Turnagain.¹² The land in some of these areas is composed of a relatively unstable material called Bootlegger Cove clay which subsided under the impact of the earthquake.

The slides in the fashionable Turnagain residential area destroyed or severely damaged considerable personal property including seventy homes. The Fourth Avenue slide area encompassed part of the city's business district; many buildings were destroyed as a section several hundred yards long subsided ten to eighteen feet. In the Government Hill area, a slide more than a mile long destroyed a grammar school and other property. The land moved several feet in the L Street slide area, severely damaging many buildings and streets. In addition, utility facilities were damaged in the slide areas.

A number of buildings located outside the four main slide areas were badly damaged or destroyed by seismic shocks, including a six-story apartment building, a five-story department store, and a sixty-foot high airport control tower. Also a fourteen-story hotel, two fourteen-story apartment houses, an eight-story office building, and a six-story office building were among those that received structural damage.¹³

Immediately following the earthquake, normal community processes were interrupted. Two of the seven Anchorage water system wells were destroyed and the system was almost entirely drained. Service was also disrupted to about 80 percent of the Anchorage Natural Gas Corporation's customers. The area's electric power failed completely and city telephone service was

disrupted. Organizations with emergency power and communications facilities began utilizing them.

Most persons were at home rather than at work when the earthquake struck, but emergency organizations such as the Anchorage police and fire departments had regular shifts on duty. The Public Safety Building, headquarters for both groups, had no major structural damage. It became the center for the city's emergency operations. Various city and other organizations and agencies worked there to coordinate the activities of their particular groups with the overall disaster operation.

All commercial radio and television stations went off the air at the time of the earthquake because of the power failure. One radio station managed to return to the air as early as 5:57 p.m. by using emergency generators.

The community's three civilian medical hospitals lacked electricity, water, telephone service, and functioning sewage disposal facilities immediately following the disaster. They escaped major structural damage, though.

The two nearby military bases, Elmendorf and Fort Richardson, sustained considerable damage. Because of their immense resources, their capabilities were not seriously hampered. The Alaska National Guard was on annual summer camp duty at Fort Richardson. This proximity to Anchorage enabled the Guard to assist quickly when it was asked to do so by civilian authorities.

The Disaster Response

The response to the disaster can be roughly divided into an emergency period and a rehabilitation period.¹⁴ Each of these periods or stages were characterized by different kinds of emergency activities.¹⁵

The emergency period began immediately following the earthquake and lasted approximately three days. This seemed to be the time when the greatest demands were imposed upon the capabilities of the community, its groups and organizations. Search, rescue, and general preservation of life functions prevailed over other kinds of considerations during this period.

The emergency period was followed by the rehabilitation period, which appeared to commence when the sense of urgency declined. At this time, many of the normal community processes and functions which had been interrupted were once again resumed. During this period, organizational and community officials were preoccupied with long-term and permanent recovery. To some extent, the community was still in the rehabilitation phase when our research was completed because earthquake-related activity was still going on.

The Emergency Period

Search and Rescue

Immediately after the earthquake, search-and-rescue activity began in Anchorage. Of the variety of groups, organizations, and individuals who participated, some had previous experience in rescue work while many others had not. Groups and organizations engaged in such work at various times during the emergency period included: the Anchorage fire department, the U.S. Army, the Anchorage police department, the Alaska state police, a local mountain rescue group, the Spenard fire department (from a suburb), and some personnel from the Anchorage Public Works Department. From time to time, these organizations absorbed individual volunteers who represented no particular group. For example, private construction people not only participated in search and rescue but also made their equipment available.

Most earthquake victims were discovered and taken to hospitals before nightfall on Friday. However, search-and-rescue efforts continued until Sunday, March 29, as a precautionary measure and because people found it difficult to believe that there had been so few casualties in light of the devastation that had occurred. As early as the evening of March 28, buildings in the damaged areas had been searched carefully on three or four different occasions.

Initially, private citizens assisted people in the damaged areas. Gradually, however, the search-and-rescue function took on a more organized character. Anchorage fire department personnel became engaged in rescue activity fairly early. Sometime after 5:40 p.m. on Friday, department personnel were involved in searching a heavily damaged department store in the downtown area. Around 6:00 p.m., the Spenard fire department began rescue operations in the Turnagain slide area. Several minutes later they were joined by men from the Anchorage fire department and the Alaska state police.

Around 6:40 p.m. on Friday, a building construction and maintenance official of the public works department began organizing teams to search the damaged areas building by building for victims and to make damage inventories. The teams were composed of volunteers and city employees, including some from public works. This emergent structure, later known as the Disaster Control Office, also engaged in other important functions such as neutralizing secondary hazards, locating and organizing public shelters, registering volunteers, and locating needed emergency supplies and equipment.

Sometime after 11:00 p.m. on Friday, an Army rescue group from Fort Richardson became involved in the rescue effort. Between 5:30 and 6:30 a.m. on Saturday, March 28, a volunteer was appointed civil defense coordinator of rescue operations. Between 7:00 and 9:00 a.m. search-and-rescue activities were, for the most part, organized. Even after this period, however, there were some uncoordinated search-and-rescue efforts.

Medical and Health Organizations

Providence Hospital functioned as the major medical facility in Anchorage during the emergency period. When city power was interrupted, an emergency generator provided power for limited areas such as the corridors, the emergency room, and operating rooms.

For many hours after the earthquake, hospital officials had no way of knowing the number of casualties to anticipate because the telephones were inoperative. No standby means for establishing communications was available. As a result, preparations were made to care for a large number of earthquake victims that never arrived.

Between 6:15 p.m. and midnight on Friday, March 27, twenty-one casualties were received. Of this number, three were dead on arrival and only seven were admitted. Between Saturday morning and Sunday night eighty-nine emergency cases were treated at the hospital, eighteen of which were definitely earthquake related.

Throughout the emergency period, Providence had sufficient personnel to handle the emergency cases. The hospital was assisted in some way or another by a number of organizations, including the Anchorage fire, police, and civil defense departments, the Army and National Guard, Alaska state civil defense, and various hospital supply houses. In addition, large numbers of private citizens volunteered their services. In fact, at one point the volunteer situation created a serious problem because staff time had to be spent trying to determine how to utilize them.

At the Alaska Native Hospital, preparations were made shortly after the earthquake for receiving hundreds of injured persons from the community. However, only eight persons were hospitalized with disaster-incurred injuries. Also, a number of refugees were housed at the hospital the night of the disaster. The lack of water, heat, power, and functioning sewage disposal facilities were probably the most critical contingencies that faced this hospital during the emergency period. Before emergency generators were borrowed, it would have been difficult to have performed major surgery at the hospital.¹⁶

Presbyterian Hospital was located in the downtown section of Anchorage and was in the L Street slide area. The hospital lacked power, water, and heat but sustained no major structural damage. Around 6:00 p.m. on Friday, Presbyterian began evacuating due to the presence of what officials defined as dangerous gas leakage. Some patients were sent home, while twenty-two were transferred to Providence. This transfer, using vehicles provided by off-the-street volunteers, was completed around 8:00 p.m. Prior to the evacuation, only two emergency cases were dealt with at Presbyterian. The hospital was reopened on Sunday afternoon, March 29.

Local, regional, and state public health officials, with the assistance of other organizations, also worked to control public health hazards following the earthquake. Friday night, residents of the community were instructed by

the health officials to boil or chlorinate all drinking water because of possible contamination.

Also on Friday night, the Army supplied local public health personnel with water trailers which they placed at central points throughout the city. Some trailers were maintained for a week after the disaster. The Army also made available four water treatment plants. On Saturday morning, March 28, public health officials established a number of inoculation centers in Anchorage. This program lasted for a week, during which 38,000 typhoid inoculations were given.

Security and Control

Every major disaster presents problems with respect to security and control, and this one was no exception. Several organizations became involved in securing the damaged areas. On Friday evening after the earthquake, a group of civilian volunteers was organized to assist regular police personnel. These volunteers were deputized and given makeshift arm bands with "police" written on them. Teams of from three to six of these volunteers were sent out with a regular police officer into the damaged downtown area. They directed traffic, guarded buildings, and controlled entry by the general public into the area.

Sometime after 8:00 p.m. on Friday, Army troops from Fort Richardson that had been requested by city officials began arriving in Anchorage to assist the police in securing the damaged sections. Alaska National Guard troops took up positions in Anchorage at about the same time.

After the damaged downtown area had been cordoned off, a serious problem developed for those who had legitimate reasons to enter the area, such as crews on emergency assignments and businessmen who wanted to make inventories and prepare for reopening. A number of organizations issued different kinds of passes and as a result guards on duty often did not know which ones to honor. To further complicate matters, many of the National Guardsmen were Alaskan Eskimos whose English skills were minimal. Sometimes they would not permit any persons with passes to enter the restricted areas of town. Numerous attempts were made to solve this problem. On Sunday, March 30, it was finally decided that three downtown checkpoints would be established. These were manned by police officers who were responsible for determining the legitimacy of a person's need to enter the restricted areas. This procedure worked reasonably well.

After Monday night, March 31, the National Guard began phasing out its troops. Also, the number of men that the Army had committed to security duty in Anchorage was reduced after Monday as the boundaries of the off-limit areas were compressed to permit the reopening of downtown businesses on Tuesday.

Commercial Radio

As the commercial radio stations returned to the air, they suspended all commercial broadcasting for the duration of the emergency period.

Instead, they functioned in a public service capacity by broadcasting emergency information and instructions from local and state officials, sending appeals for help and vitally needed resources, disseminating missing persons information, and airing personal messages.

The radio stations' role in emergency communications was particularly critical because of the unreliability of telephone facilities. Station KFQD acquired a short wave radio from Alaska state civil defense officials very soon after the earthquake struck. Throughout the emergency period the station did a considerable amount of broadcasting in cooperation with that organization. Station KENI located mobile broadcasting facilities at the Public Safety Building and established a similar relationship with city civil defense. In addition, citizen band and ham radio operators provided a sorely needed standby communications capability for the community.

Utilities

The immediate response of the two principal electric utilities in the Anchorage area, the municipal light and power department and the Chugach Electric Association, was to send out crews to make inventories of the damage to their respective systems and begin restoration work. After 7:15 on Friday, power was restored to some parts of the community on a very intermittent basis.

It was not until about 5:36 p.m. on Saturday that somewhat dependable electric service was restored to Anchorage. About this time, the Chugach Electric Association and municipal light and power were supplying power to most of their customers who could receive service. Throughout the emergency period, the electric utilities made further damage assessments, temporary repairs and adjustments, and restored service to buildings as they were determined to be safe for occupancy. For the electric and other utilities, considerable rehabilitation and restoration effort loomed.

Immediately following the earthquake, Anchorage Natural Gas Corporation personnel began surveying the damage to their transmission lines. Throughout the emergency period, crews were involved in isolating the damaged portions of the distribution system and restoring service to the unaffected areas of the city. Anchorage Natural Gas was considerably aided by gas crews from Seattle who responded to the corporation's request for help and began arriving in Anchorage on Saturday night.

Similar to the other utilities, Anchorage Public Works Department's water utility division spent the emergency period locating and isolating damaged sections of the water system and restoring service to the unaffected sections. Thus, areas that were receiving water service were gradually expanded. Water service was generally available throughout Anchorage by Sunday evening except for some of the areas where major slides had occurred. Several days later, irrigation pipe was used for surface distribution of water in some of the slide areas such as Turnagain.

As noted elsewhere, the telephone service in Anchorage was disrupted. Emergency work commenced shortly after the earthquake as employees began arriving at the four telephone exchange locations. Limited service was restored within each exchange by 8:00 p.m. on Friday; however, calls could not be made between them. Lines were restored on a priority basis with key organizations and persons receiving first attention. By Sunday afternoon, a large portion of the telephone system was reportedly operative after extensive temporary repairs had been made. For a number of days, though, overloading remained a serious problem causing portions of the system to break down from time to time.

Service and Welfare Organizations

The Salvation Army began a feeding operation in Anchorage on Friday evening following the earthquake and continued it throughout the emergency period. They provided coffee and sandwiches for emergency crews and military and civilian personnel on sentry duty, as well as for the general public. On Saturday, the military also became involved in feeding when they set up field kitchens at a number of locations in Anchorage. Also during the emergency period, several public shelters were established in the community. These were established by a number of groups, including The Salvation Army, city officials, the American Legion, and various church groups.

Civil Defense

For all practical purposes, Anchorage had no local civil defense organization when the disaster struck. The Anchorage civil defense department had had a director and secretary, but less than two weeks before the disaster the director had resigned. After the earthquake, however, the former director made himself available to city officials. On Saturday morning he was appointed as acting head of city civil defense operations, and a number of volunteers began working under his authority. Up until this time, numerous actions had been taken by various persons in the name of civil defense, although it didn't really exist until the former director was temporarily reinstated. During the emergency period, the CD director and his volunteers worked in a supportive and coordinating capacity with other community groups and organizations.

Alaska state civil defense, like the U.S. Army and The Salvation Army, was involved in emergency operations in other communities in the state in addition to Anchorage. Its staff was expanded during the emergency to include coordinators from the various state departments. Also, representatives from such organizations as the Army, Alaska National Guard, Red Cross and The Salvation Army came together at state civil defense headquarters in Anchorage to coordinate an overall state disaster operation.

As it did in other communities during the emergency, Alaska civil defense on a number of occasions located and provided resources needed in

the Anchorage area. For example, the state Radio Amateur Civil Emergency Service organization (RACES), which is a volunteer Alaska civil defense ham radio organization, provided a number of Anchorage groups with radio communicators for emergency communications. With respect to emergency activities in Anchorage, state CD and city officials -- including city CD personnel -- functioned more or less independently of each other. There were times when cooperation and coordination was required, though.

By Tuesday morning, March 31, there were a number of indices observable in Anchorage which suggested that the emergency period was over and the rehabilitation phase had begun. By this time, the utilities were fairly reliable and had been at least temporarily restored in the major portions of the city. Streets were for the most part passable, except in some of the major slide areas, as debris had been cleared and cracks and crevices had been filled with gravel by public works employees. Also, the perimeters of the restricted areas were significantly reduced and many businesses, including banks, had reopened. Both city newspapers were publishing regular editions. Further, many important city officials who had been operating out of emergency headquarters at the Public Safety Building returned to their normal work locations on Tuesday. For example, the mayor and city manager returned to their city hall offices.

Rehabilitation Period

In many respects, the activity in Anchorage during the rehabilitation period was considerably less dramatic than that during the emergency period. However, it was also very important. During this period, community organizations and groups, with the assistance of state and especially federal agencies, worked to restore community capabilities to their pre-disaster levels. We will not attempt to present here a complete description of the rehabilitation period. Rather, we will discuss briefly some of the salient features of this stage of the disaster in order to provide a broader context in which long-term organizational change can be viewed.

Federal Aid

Shortly after the earthquake, representatives of a number of federal agencies flew to Anchorage to determine firsthand how the resources of their respective organizations could be used most effectively in assisting the communities of Alaska. Considerable federal aid was provided during the emergency period. However, federal assistance was even more noticeable during the rehabilitation phase.

Since the President of the United States declared the Alaska earthquake to be a "major disaster," affected communities became eligible for

long-term aid under the Federal Disaster Assistance Act (Public Law 875). The Office of Emergency Planning, (OEP), the agency responsible for administering the funds available through this act, appointed the Alaska District Corps of Engineers as contracting and supervising agent in most of the damaged areas in the state -- including Anchorage. Of the total damage to state and local public facilities in Alaska, \$63,943,000 worth of restoration work was programmed under Public Law 875 alone.¹⁷

After the earthquake, the OEP made over a million dollars available to Anchorage for demolition and debris clearance.¹⁸ This work was completed in the fall of 1964. In addition, the Corps of Engineers supervised the spending of several millions of dollars to restore water, sewage, power, and telephone systems to rebuild one school, and to repair several others, plus some city-owned buildings and the port. It was anticipated that around \$23 million would be spent in the Anchorage area under Public Law 875 and that by the time restoration was completed, additional millions of dollars that were made available by other federal agencies would be spent.¹⁹

The Urban Renewal Administration was one of the federal agencies that assisted Anchorage and other Alaskan communities during the rehabilitation period. For example, it made funds available to Anchorage for stabilizing slide areas, and granted money for an urban renewal program for the damaged downtown portion of the city.²⁰

Organizational Interaction

Rehabilitation in Anchorage involved a network of interacting organizations and agencies, and to some extent the general public. Decisions with respect to long-term restoration goals and procedures had to be made by local, state, and federal organizations. Since the decisions and actions taken by one organization often involved or had consequences for others, coordination between them was necessary. Meetings of local, state, and federal officials were often held to solve problems and explain required procedures. Many such meetings were open to the public or were conducted expressly for public information and received considerable radio and newspaper coverage. These Anchorage media also kept the public informed on other important disaster related events such as reconstruction actions taken by the city council.

A number of local organizations, including the public works department, the telephone department, municipal light and power, and the Anchorage school district, worked closely with the Corps of Engineers throughout the rehabilitation period since the corps was responsible for restoring their facilities. Liaison between these organizations and the Corps was established because coordination was required in order to meet the long-term disaster problems effectively.

Alaska state civil defense was also a part of the network of organizations involved in Anchorage rehabilitation. Local officials seeking disaster

aid under Public Law 875 must apply through their respective states. State civil defense had an important rehabilitation role because the governor of Alaska assigned it the job of processing local Public Law 875 project requests. Thus, Alaska civil defense officials functioned as liaison between Anchorage and federal officials in terms of this aspect of the restoration program.

Finally, The Salvation Army and Red Cross were involved in rehabilitation work in Anchorage as well as in several other communities in the state. Most Salvation Army projects were in communities such as Seward, Kodiak, and Valdez where officials defined the need to be greatest. The Red Cross began providing long-term rehabilitation assistance to individual families after national staff personnel arrived in Anchorage on Saturday, March 28. The bulk of this program was completed by October 1964.

There was still considerable disaster related activity occurring and programmed for the Anchorage area when our research was completed a year and a half after the disaster. Thus to some extent, the community was yet in the rehabilitation phase of the disaster. A number of persons reported that it would be a long time before their respective organizations were back to "normal."

In this chapter, we discussed the setting in which the disaster occurred, focusing on some of the significant social and economic features in the state in general, and Anchorage in particular. Also, we briefly discussed the emergency response of some of the key organizations and groups as well as some of the general aspects of the rehabilitation period. In the next chapter, we will consider the long-term organizational changes which resulted from the disaster.

NOTES: Chapter II

1. Office of Emergency Planning, Impact of Earthquake of March 27, 1964 Upon the Economy of Alaska, A report prepared by OEP, Executive Office of the President, Edward A. McDermott, Director (Washington: Office of Emergency Planning, April 1964), p. 1.
2. Ibid.
3. For an extensive discussion of the state's industries see George W. Rogers, The Future of Alaska: Economic Consequences of Statehood (Baltimore: The Johns Hopkins Press, 1962).
4. Office of Emergency Planning, Impact of Earthquake, p. 17.
5. Ibid., p. 16.
6. From the records of the city of Anchorage planning department.
7. Preliminary Report, Prince William Sound, Alaskan Earthquake March-April 1964 (Washington: Seismology Division, Coast and Geodetic Survey), p. 1.
8. U.S. Department of the Interior, Geological Survey, Alaska's Good Friday Earthquake, March 27, 1964: A Preliminary Geologic Evaluation, by Arthur Grantz, George Plafker, and Reuben Kachadoorian, Geological Survey Circular No. 491 (Washington: Government Printing Office, 1964), p. 2.
9. Office of Emergency Planning, The Alaska Earthquake: A Preliminary Report, 279 Days of Federal Reconstruction Effort (Washington: Office of Emergency Planning, December 1964), pp. 18-19.
10. U.S. Department of the Interior, Preliminary Geologic Evaluation, p. 2.
11. Ibid., p. 14.
12. Ibid.
13. The National Board of Fire Underwriters and the Pacific Fire Rating Bureau, San Francisco, A Report, The Alaska Earthquake, March 27, 1964 (New York: The National Board of Fire Underwriters, 1964), p. 26.
14. For a more detailed discussion of the organized community response to the earthquake see Daniel Yutzy with William A. Anderson and Russell R. Dynes, Community Priorities in the Anchorage, Alaska Earthquake, 1964, Disaster Research Center Monograph Series (Columbus: Disaster Research Center, The Ohio State University, 1969).

15. For a discussion of stages in disaster see John W. Powell, Jeanette F. Rayner, and Jacob E. Finesinger, "Responses to Disaster in American Cultural Groups," Symposium on Stress (Washington: Army Medical Service Graduate School, Walter Reed Army Medical Center, March 16-18, 1953), pp. 178-181.
16. Martha Richardson Wilson, M.D., "Effect of the Alaska Earthquake on Functions of PHS Hospital," Public Health Reports 79, no. 10 (1964): 861.
17. Office of Emergency Planning, The Role of the Office of Emergency Planning in the Alaska Earthquake, A report prepared by OEP, Executive Office of the President, Edward A. McDermott, Director (Washington: Office of Emergency Planning, September 1964), p. 1.
18. Ibid., p. 8.
19. Ibid., p. 9.
20. Office of Emergency Planning, 279 Days of Federal Reconstruction, p. 13.

CHAPTER III

LONG-TERM ORGANIZATIONAL CHANGES

Change and the Conditions for Change

In this chapter we will present the findings of the study. We will discuss the long-term social consequences of the disaster for each of the twenty-three organizations in our sample.

Seventeen of the twenty-three organizations underwent some disaster related long-term change. The disaster was responsible for long-term organizational change to the extent that it brought about certain conditions which served as an impetus for change. The data of the study indicate that these conditions were either internal or external to the affected organizations. Some of the seventeen organizations underwent long-term change primarily in response to new demands brought on by altered environments. Others changed principally because of internal patterns and processes, for example, in response to strain or because new forms of organizational coping behavior were learned. Also, certain organizations underwent change in response to both internal and external variables.

In each of the organizations that experienced some long-term change, either internal or external conditions or a combination of the two caused (1) the development of new processes or patterns of change, or (2) the acceleration of preexisting patterns, or (3) led to the occurrence of both kinds of change.

The relationship between conditions and the kinds of changes each of the organizations experienced can be illustrated in a three-by-three table (see table 1). In the left margin the types of change-producing variables are listed; here, "mixed" refers to the fact that both internal and external conditions produced change in some organizations. Along the top are the resultant changes; in this instance, "mixed" refers to the fact that in some organizations both the emergence of new patterns as well as the acceleration of existing ones occurred. Theoretically, nine associations were possible. However, as the table shows, only eight occurred.

The presentation of the data will be organized according to the findings shown in table 1. For example, we will initially discuss those organizations appearing in the first category; that is, those in which new patterns of change developed that were brought on by internal organizational factors. The six organizations that did not undergo any long-term change will be discussed last.

Relevant pre-disaster information about each of the twenty-three organizations will be included so that we will have some baseline from which

TABLE 1

DISASTER CONDITIONS AND THEIR CONSEQUENCES

Conditions	Types of Changes		
	New Patterns	Accelerated Patterns	Mixed
Internal	I Anchorage Police Alaska Native Hospital Providence Hospital Alaska National Guard Anchorage Natural Gas Salvation Army Anchorage Daily Times	IV Municipal Light and Power	VII Chugach Electric
External	II Anchorage Fire Department	V Northern Television KBYR	VIII Port of Anchorage
Mixed	III Anchorage Civil Defense Red Cross	VI	IX Alaska State Civil Defense Anchorage Public Works

to view the modifications that took place. Since we have focused the study on Anchorage, and because several of the organizations we will be discussing are part of the municipal structure, we will begin with a brief discussion of Anchorage city government at the time of the earthquake. The analysis of specific organizations will follow it.

Anchorage City Government

The city of Anchorage had a council-mayor form of government (see figure 1). The city council was composed of eight councilmen and a mayor elected at large in a nonpartisan election; three members of the council were elected each year. The chief function of the mayor and council was to determine governmental policy by enacting ordinances and resolutions. The council appointed a city manager to implement its policies.

The city manager was the chief administrative officer of the city and was responsible for coordinating the activities of the municipal departments. He had authority over all employees in these departments, even under disaster conditions. He had an assistant and a management analyst; the latter performed research tasks, worked on special projects, and generally advised and assisted the city manager.

The mayor and council also appointed a city attorney and a city clerk. The city clerk conducted elections, served as clerk to the council, maintained official city documents, and served as voter registrar. The city attorney had two assistant city attorneys. His office was responsible for representing the city in court proceedings and for providing legal advice to the council and other city employees.

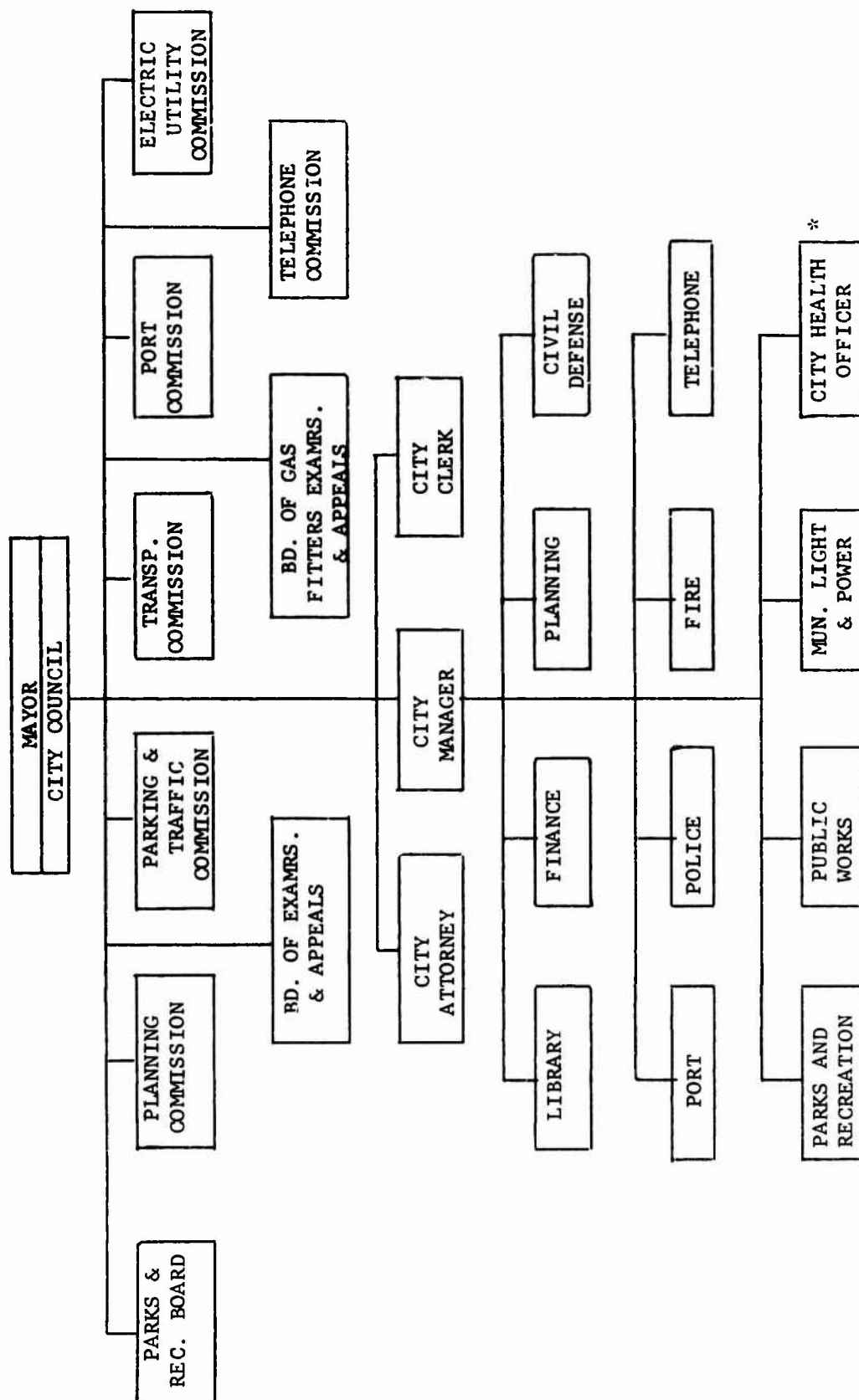
Commissions and boards established to help the council carry out its policies were: transportation commission; board of gas fitters, examiners, and appeals; parks and recreation board; planning commission; board of examiners and appeals; and telephone commission.

The following departments met the operational needs of the city: library, finance, planning, civil defense, port, police, fire, telephone, parks and recreation, public works, and municipal light and power. All department directors were responsible to the city manager. The city's public health services were provided through a contract with the Alaska State Department of Health and Welfare.

This, then, was the general structure of municipal government in Anchorage when the disaster occurred. The following is the analysis of the disaster induced long-term changes undergone by a number of organizations in Anchorage.

FIGURE 1

CITY OF ANCHORAGE



*Under contract through Alaska Department of Health and Welfare.

New Patterns of Change
Initiated by Internal Conditions

In this section, we will discuss organizations that acquired new patterns of change in response to certain internal characteristics, e.g., "organizational learning," and in which no pre-disaster patterns of change were accelerated. Seven organizations fall into this category: Anchorage police department, Alaska Native Hospital, Providence Hospital, Alaska National Guard, Anchorage Natural Gas Corporation, The Salvation Army, and the Anchorage Daily Times.

Anchorage Police Department

Pre-disaster Structure. -- A police chief was in charge of the department which had eighty-nine full-time employees at the time of the earthquake. The police department had four divisions: operations, service, vice investigation, and training (see figure 2). The largest was operations, which consisted of three bureaus: traffic and records, investigation, and patrol. This division was supervised by a captain who was assisted by five lieutenants -- one in traffic and records, one in investigation, and three in patrol. The service division, supervised by a sergeant, operated the city jail, the prison farm, and the city animal shelter.

The police department had no written disaster plan. Some policemen thought that it would be impossible to effectively pre-plan for disaster. Others felt that disaster demands would differ from routine emergencies primarily in a quantitative rather than qualitative sense, so most disasters could be handled by using basic procedures and more men.

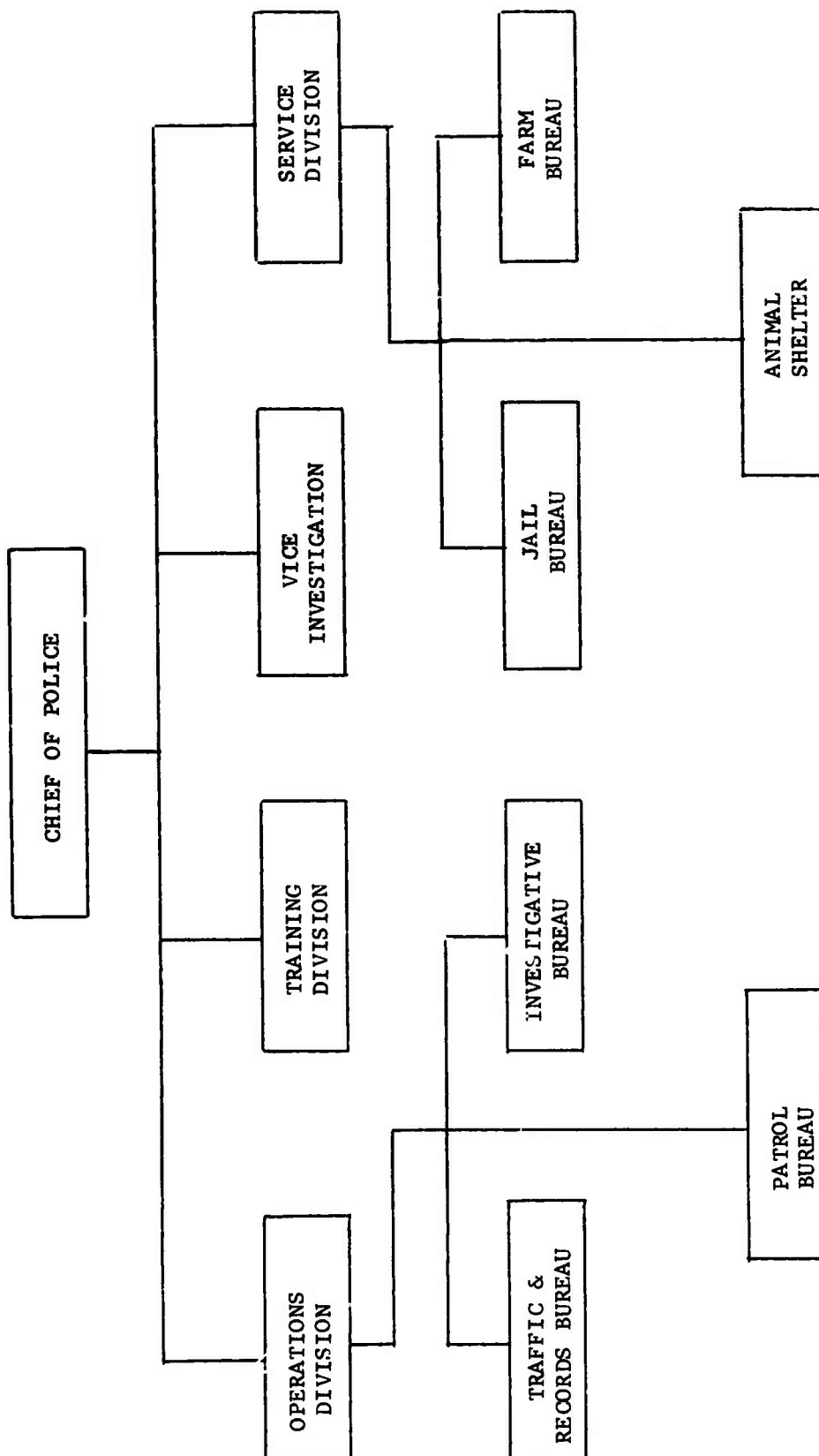
When major emergencies occurred, off-duty policemen were notified to report to the station, which was in the Public Safety Building. There was no auxiliary police force.

Long-term Change. -- The earthquake demonstrated rather conclusively that the demands made upon the Anchorage police department during a major emergency could be so great that additional manpower would be needed. During the emergency period following the earthquake, the police force was augmented with untrained volunteers. Police and civil defense officials later decided that it would be more effective to establish and train a police auxiliary which could be called upon for assistance in future emergencies. The auxiliary force would primarily handle traffic and crowd control, leaving regular police personnel relatively free to engage in more important activities.

Several months after the disaster, the American Legion and the Veterans of Foreign Wars each agreed to organize a group of men to be included in the

FIGURE 2

ANCHORAGE POLICE DEPARTMENT



auxiliary. A year and a half after the earthquake, the VFW unit was meeting one evening a week with the police department's training officer. The American Legion was expected to form its unit sometime in the near future. The total force was expected to number around sixty men when it was completed. Civil defense funds were being used to purchase equipment.

The police department also had difficulty notifying off-duty officers following the earthquake and during a major fire which occurred in the port area several months later. As a result, a back-up notification procedure was established. During an emergency, police officials would instruct local radio stations to broadcast a notice for off-duty personnel to report to the police station.

Our data indicate, then, that the police department underwent some change following the disaster as a result of "organizational learning." That is, these changes evolved from some of the contingencies which arose during the disaster and are attempts to prevent their recurrence.

Alaska Native Hospital

Pre-disaster Structure. -- The Alaska Native Health Service Area office -- part of the U.S. Public Health Service -- administered and coordinated the state-wide health program for Alaska natives. Alaska Native Hospital (ANH) was the largest of the public health service hospitals in Alaska which came under the jurisdiction of the area office. All complicated cases from other public health service hospitals in Alaska were sent to ANH.

Treatment at the 301 bed hospital was free to all persons defined as descendants of Alaska natives -- Aleuts, Eskimos, and Indians. Alaska Native had a large tuberculosis and pediatric patient load as well as an active surgical, internal, and general medical program. Its medical staff and the staff of the adjacent area office also worked at the village level, holding clinics and administering preventive and direct treatment programs.

Just prior to the disaster the medical staff at ANH consisted of approximately twenty-two persons with various specialties. The service unit director was responsible for the overall operation of the hospital. He was assisted by a clinical director and a hospital administrator. The clinical director supervised departments such as surgery, medicine, pediatrics, X ray, nursing, and medical records. The nonmedical departments such as maintenance, housekeeping, laundry, and building and grounds were directed by the hospital administrator. At the time of the disaster there was no administrator because the former one had transferred to another hospital and his replacement had not yet arrived.

The hospital had no previous experience with disasters. A committee had just completed a basically nuclear catastrophe oriented disaster plan but it had not been well distributed among the hospital staff. Personnel

turnover had been very high and all of the disaster committee members except the chairman had transferred to other hospitals. Thus the personnel who knew the most about emergency plans were no longer with the organization when the disaster occurred.

The hospital had a 10 KV emergency generator which could light the surgery and emergency rooms. This generator had been regularly inspected and was considered adequate for any emergency situation.

Long-term Change. -- After the earthquake, a committee of staff members was appointed to analyze the organization's disaster performance and to recommend needed changes. As a result, some changes were made which reflected the earthquake experience.

A new disaster plan was issued after the disaster with a format which differed in several respects from the one devised before the earthquake. For example, the new plan was organized so that the staff could more quickly locate the sections pertaining to their own duties. Also, the new plan had a brightly colored cover, and copies were put in conspicuous places. This was done to prevent the recurrence of the reported difficulty in finding the few copies of the previous plan during the emergency.

The revised plan permitted using some patients as volunteers, under the direction of hospital personnel. This change also reflected the earthquake experience because patients proved to be a valuable source of manpower. "They performed as messengers, stretcher bearers, janitors, elevator operators, dietary helpers, and general straightener-uppers."¹

The disaster demonstrated that using the emergency room and especially the outpatient department to treat large numbers of victims would have been exceedingly difficult. The committee appointed to review the hospital's disaster problems recommended modifying a number of architectural features in the outpatient department. This was done to the extent that available funds would permit.

Some long-term changes, then, were made at the Alaska Native Hospital. However, a number of suggested changes were not implemented due to a lack of money. For example, some of the problems with the layout of the outpatient department were not solved. Similarly, need for a larger auxiliary generator was recognized by hospital officials. For a number of critical hours following the earthquake, some important areas of the hospital had no light because the existing emergency generator was too small. However, a new generator was not purchased due to a lack of funds.

Providence Hospital

Pre-disaster Structure. -- The Sisters of Charity of Providence owned and operated this general hospital. With 155 beds, Providence was the

largest civilian hospital of its kind in Alaska. When the hospital was founded in 1939 with a fifty bed capacity, Anchorage was comparatively small. Several years later, Anchorage mushroomed into the state's largest city, with a growing need for a larger hospital. To meet this need, the sisters opened the larger facility in 1962.

An administrator was responsible for the overall operation of the hospital. She had two administrative assistants. The hospital employed nearly 200 full and part time persons including over 100 registered nurses. The medical staff of 57 physicians was almost equally divided between specialists and general practitioners. Since Providence did not have a resident staff, patients were admitted through private physicians and clinics. (Figure 3 outlines the major structural aspects of the organization.)

The hospital had not experienced any previous emergencies as demanding as the earthquake. Written disaster plans for the old hospital building were being revised to fit the new building. The disaster coordinator for the medical staff had completed a first draft only a week prior to the earthquake. The hospital had an auxiliary generator which could provide some power in the event of an emergency.

Long-term Change. -- Providence instituted very few long-term changes after the earthquake. A year and a half later, the disaster plan had not been completed although some work had been done on it. Because the hospital had borrowed pumps to transfer water from an adjacent spring to the hospital's mains, it had water for drinking and sewage disposal throughout the emergency period. As a result, a pump was purchased so the spring could be utilized whenever necessary.

The staff recognized the need for a larger auxiliary generator. The one available had not provided enough power to light areas such as X ray, the kitchen, and patients' rooms. But like Alaska Native Hospital, Providence had no funds to purchase a bigger one.

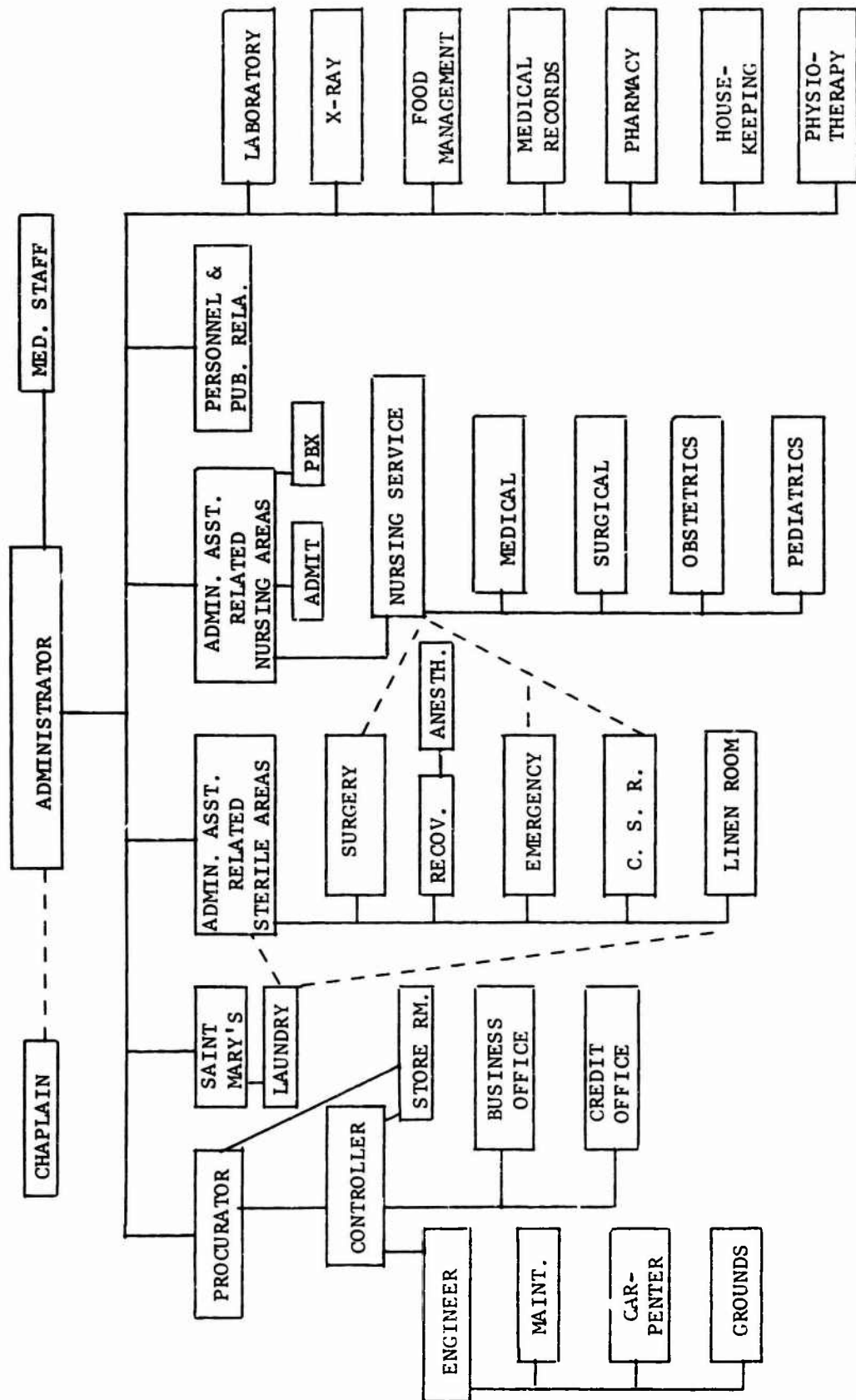
Alaska National Guard

Pre-disaster Structure. -- The Air Force and Army elements of the Alaska National Guard came under the authority of the Alaska adjutant general. The air unit, called the 144th Air Transport Squadron, had its headquarters at the Anchorage International Airport. One of the Army's three battalions, the 3rd, also had its headquarters in Anchorage.

When the earthquake occurred, the 1,300 men of the National Guard had just completed their annual two weeks of training and active duty at Fort Richardson. Included in this group were the 1st and 2nd Scout Battalions, composed of primarily Eskimos and Indians from villages along the Arctic rim; the 3rd Battalion, 297 Infantry; the 216th Transportation Company; the 910th

FIGURE 3

PROVIDENCE HOSPITAL



Engineer Combat Company; and smaller signal, ordnance, and special forces detachments. The Guard had no previous experience in a major natural disaster.

Long-term Change. -- Only one change was initiated in the Alaska National Guard as a result of the earthquake experience. Guard personnel reported a year and a half later that they were taking the experience into account by revising their emergency troop plans. At the time, it was anticipated that it would be several months before this was completed.

Anchorage Natural Gas Corporation

Pre-disaster Structure. -- At the time of the disaster, the Anchorage Natural Gas Corporation had been established only three years. The company operated 130 miles of gas distribution mains and provided service for 5,000 customers in the Anchorage area. An executive vice president and treasurer, and a vice president and general manager were responsible for the overall operation of the organization. The corporation's six major divisions were: technical staff group, controller's department, distribution, customer service, customer installation, and sales. There were 64 employees.

The corporation had no written disaster plan. It was generally thought that good maps of the distribution system and the experience acquired in meeting the frequent intraorganizational emergencies were adequate disaster preparations. The corporation had a mobile radio system and an emergency generator.

Long-term Change. -- The only disaster related change occurred six weeks after the earthquake when the vice president and general manager was promoted to president. Apparently he had demonstrated unusual ability to deal with a variety of contingencies during the emergency, and thus was rewarded for his performance with a promotion.

Alaska Salvation Army

Pre-disaster Structure. -- Including the unit in Anchorage, The Salvation Army had fourteen corps centers in the state where its professional personnel provided the customary programs such as welfare assistance and religious service. In addition, committees of local lay people administered several Salvation Army extension units.

Anchorage was the hub of Salvation Army activity in the state. Both the head of the organization in Alaska, the divisional commander, and his second-in-command, the divisional secretary, worked out of the Anchorage headquarters. There was a staff of twelve in the city. The Salvation Army also operated two institutions in Anchorage -- a home for unwed mothers and a social rehabilitation center for men.

During major emergencies the Anchorage group, like Salvation Army units elsewhere, supplied the personnel of emergency organizations with food and coffee. Most of the personnel were trained by civil defense for disaster service.

In January 1964, men who were beneficiaries of the rehabilitation program and who resided at the center were organized on a volunteer basis into crews which would respond in the event of a community disaster. These teams had several functions: food preparation, housing or relocation, transportation, and communications. Each team had a leader and five men working under him. Membership of the emergency teams changed from time to time, but there was always a nucleus of experienced persons available. The crews were activated under the guidance of a professional Salvation Army worker.

Long-term Change. -- Only a few changes took place in the organization as a result of the disaster. First, implementation of plans made just prior to the earthquake to begin organizing a new corps center in Kodiak were delayed for about two years.

Also, Salvation Army officials said that the earthquake experience sensitized them to the need for increased disaster preparedness, so they purchased a new canteen which can be used to prepare food during emergencies. It was considered an important new resource because of the self-contained power unit which will operate it for a week when normal power is unavailable.

Anchorage Daily Times

Pre-disaster Structure. -- The Anchorage Daily Times was the largest of the two Anchorage newspapers. It had a daily circulation of approximately 27,000 and was published 6 afternoons a week. An editor-publisher was in charge of the organization. About 62 persons were employed in the 4 departments: circulation, advertising, accounting, and the news room.

Long-term Change. -- As a member of the Associated Press, the Daily Times supplied AP with Anchorage area news. When normal communications channels were erratic after the earthquake, the newspaper maintained contact with AP officials outside the state through an informal arrangement with some local ham radio operators. Somewhat later, the newspaper and AP made a formal agreement with several local ham operators whereby the latter would again provide them with aid in the event of future emergencies. Thus, an emergent pattern which grew out of the exigencies of the earthquake became a formal standby mechanism.

New Patterns of Change Initiated
by External Conditions

The City of Anchorage Fire Department was the only organization in which new environmental conditions resulted in the emergence of new patterns of change without also causing the acceleration of pre-disaster processes of change.

City of Anchorage Fire Department

Pre-disaster Structure. -- The upper echelon of the fire department consisted of the fire chief, two assistant chiefs, and a fire prevention officer (see figure 4). Actual fire operations were normally coordinated by the assistant chiefs. The chief generally became familiar with each fire call but unless the operation was unusually large he did not become directly involved. Personnel were divided into two shifts; each shift was on duty during alternating twenty-four-hour periods.

There were fifty-two employees when the earthquake struck, but the department was considered to be undermanned. High operational costs related to the special problems faced by Alaskan communities were primarily blamed for the department's inability to keep manpower up with requirements.

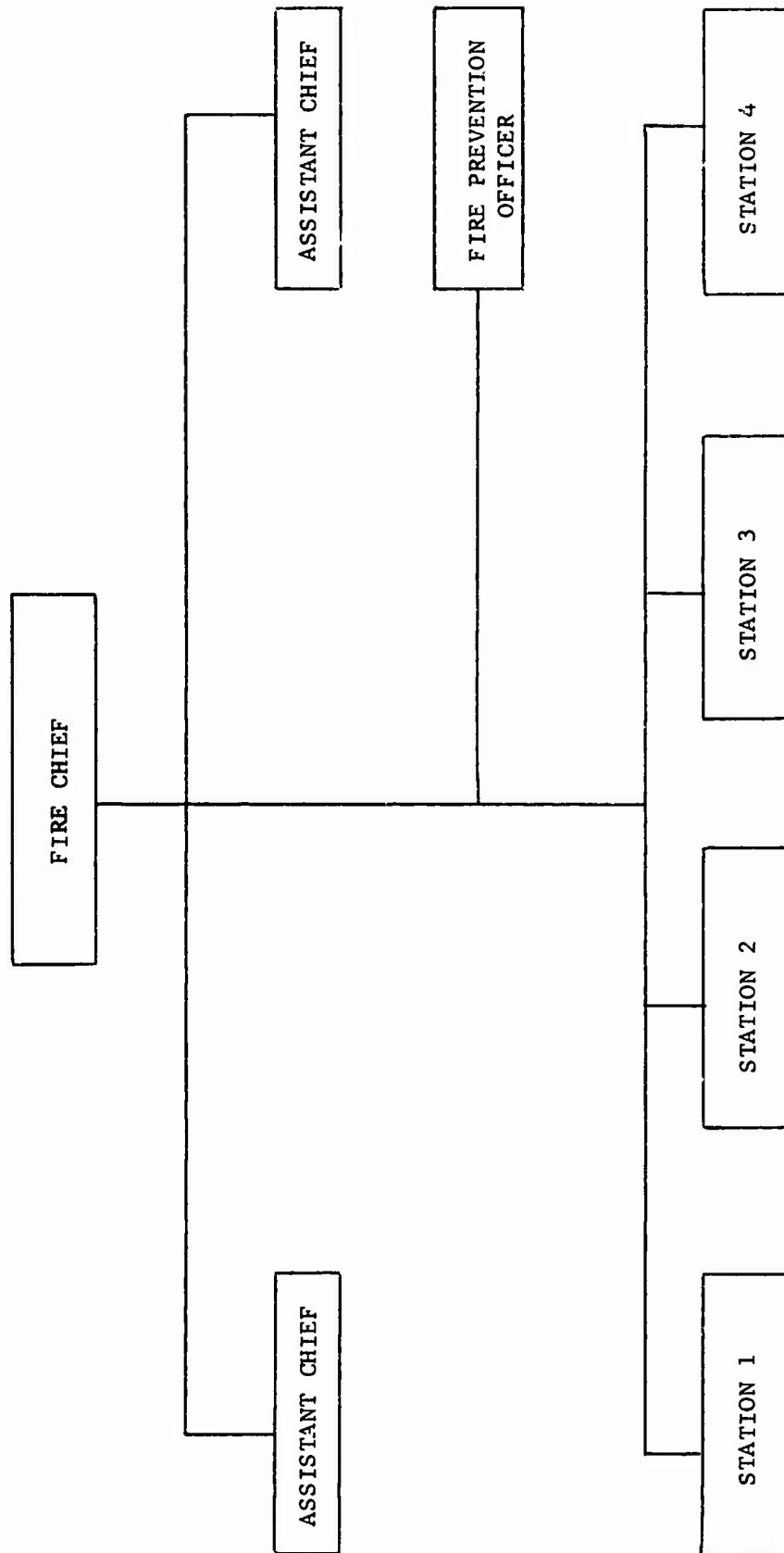
To ease the manpower shortage the fire department used volunteers who received a fee for each call they made. The turnover rate for volunteers was rather high and they were not always available for duty. Generally, about ten would respond to a call. Some volunteers were quartered in each fire station to increase the availability of manpower.

The fire department operated out of four stations strategically located throughout the city. Both operational and reserve fire fighting equipment was housed in the stations. All vehicles were equipped with two-way radios. The base station and dispatching room for the department's communication system were located at headquarters, the downtown station in the Public Safety Building. Headquarters received all alarms and dispatched fire equipment from any of the stations to the emergency area. When the department became involved in a major fire, the only way to call in off-duty personnel was by telephone. In addition to its fire fighting function, the department also operated an emergency ambulance service with three vehicles.

Fire department personnel were accustomed to working with city policemen. When firemen made a call, the police dispatched men to the same area to maintain traffic and crowd control and generally provide assistance.

The metropolitan area had other sources of fire protection. The Anchorage department had mutual aid agreements with the two local military bases, Elmendorf and Fort Richardson. These involved the use of men and

FIGURE 4
ANCHORAGE FIRE DEPARTMENT



equipment. The suburbs of Spenard and Turnagain, a 14-square-mile section of the Anchorage area, received added fire protection from the Spenard Fire Department, a primarily volunteer department operating under contract with the city. This department had a permanent staff consisting of a chief, 2 assistant chiefs, and 4 paid men. There were 36 volunteers.

The Anchorage Fire Department neither anticipated nor planned for a natural catastrophe. However, fire department and civil defense personnel had discussed the possible need for evacuation during a nuclear disaster.

Long-term Change. -- When competing Alaskan ports were damaged by the earthquake, the Port of Anchorage expanded dramatically -- which increased its fire hazard. The problem of supplying added fire protection was serious because the fire department was undermanned even before the earthquake.

Since the cost of the best protection, hiring more firemen, was considered prohibitive, an alternative was found. In January 1965, a fire official became the port area fire inspector. His assignment was to conduct a systematic fire prevention program to reduce the fire hazard. Also, the fire department formed and trained a civil fire brigade to assist with port area fires. The brigade, composed of personnel from various businesses in the port area, was supervised by the fire inspector.

In conclusion, the fire department changed because the port changed. An organization functions in an environment composed in part of other organizations. As one organization changes it may create problems for others, making it necessary for them to change also. We have here an empirical case of this phenomenon happening.

New Patterns of Change Initiated by a Combination of Internal and External Conditions

New patterns of change were initiated in the Anchorage Civil Defense Department and the Red Cross South Central Alaska Chapter as a result of both altered environmental and internal factors. Following the disaster, the organizations received greater external support, and new patterns of coping behavior were learned and converted into long-term organizational features.

Anchorage Civil Defense

Pre-disaster Structure. -- The Anchorage Civil Defense Department, established in 1962, was operated by a paid director and a secretary. The heads of city departments such as police, fire, and telephone were expected to cooperate in developing civil defense plans and programs. At various times, individual volunteers and members of assorted organizations were involved in CD programs.

The Anchorage CD program followed federal government guidelines. It included identifying and stocking public shelters, installing and maintaining public warning facilities, and providing the public with civil defense training and education. The city received matching operating funds from the federal government, which were administered through the state of Alaska.

Under state law, Anchorage was part of the Greater Anchorage Civil Defense Disaster District, an area of approximately 800 square miles. The Anchorage CD director was also the district's director. The local CD disaster plan was a district dispersal and evacuation plan geared for nuclear disaster.

The CD director kept a list of key persons who were to be notified in the event of a disaster. This group, called the Civil Defense Emergency Action Group, was composed of the following persons: mayor of Anchorage, city manager, police chief, manager of the city telephone department, city health officer, a state police divisional commander, representatives of the local school system, the official CD radio station, and the Radio Amateur Communication Emergency System (RACES) -- the amateur radio group. These persons were expected to become a part of the greater Anchorage area emergency civil defense organization. They would be responsible for coordinating the activities of their respective groups and organizations with the overall emergency effort.

An emergency broadcast center was established at the civil defense headquarters in the basement of the Public Safety Building. Under the Emergency Broadcast System, which replaced Conelrad, KFQD-AM was designated the official CD radio station and was connected to the emergency broadcast center by a direct telephone line. Thus, during an emergency, information from the CD broadcast center could be transmitted directly over the radio station's facilities and then rebroadcast by other community stations. At the time of the earthquake, then, local CD and the community did have a limited mass emergency broadcast capability. It was not until after the disaster that area civil defense and radio officials, along with state and national officials, began to systematically consider the development of an adequate emergency broadcast organization.

Shortly after civil defense was organized, the Cuban missile crisis occurred. Briefly thereafter, Anchorageites showed an unusual amount of interest in CD preparedness and programs. Many persons volunteered their services and numerous groups asked the director to speak on individual and community civil defense needs.

This interest was almost entirely in terms of war-caused rather than natural disasters, and the public expected officials to be similarly oriented. Indeed, most civil defense department activity was related to the threat of nuclear war. As a result of the Cuban scare, the director published an eighteen page pamphlet of CD emergency instructions for the community. Only one paragraph considered natural disaster. Interestingly enough, it gave instructions about how to take cover during an earthquake.

The director believed that civil defense programs should encompass natural catastrophes. However, he felt that such activity would receive little support because most people perceived CD's role as limited to man-made disaster.

The interest shown in civil defense as a result of the Cuban crisis was short lived. When memory of the threat waned, some people began questioning the need for providing funds for the department. On one occasion, city council denied the director's request for an assistant. During the 1964 budget discussion some councilmen were opposed to continuing the department. There was enough support, however, and the department was given operating funds.

On March 15, 1964, twelve days before the earthquake, the civil defense director resigned to enter private business. Although the city manager began looking for a replacement some councilmen objected and claimed that the department should be discontinued for financial reasons. At the time the disaster struck, Anchorage had no CD director and the status of the department was indefinite.

Long-term Change. -- A number of disaster related changes occurred in the Anchorage civil defense organization following the earthquake. Probably the most important change was the increased support the organization began receiving.

In a very real sense, the earthquake contributed to the survival of the department. It provided civil defense supporters with a more convincing argument to use in defense of the organization and its programs. Community officials seemed to feel that CD had done an admirable job and that the ex-director had returned because he was concerned about the stricken community. Thus, the climate was such that the department could make certain gains which might have been all but impossible under more stable circumstances.

For the time being, the threat to the survival of the organization was neutralized. For example, during the emergency period, the former director was reappointed without opposition. In addition, one civil defense official noted:

Following the earthquake they made the decision immediately that they were going to keep it /civil defense office/ open. . . . So that was a direct result of the earthquake. I rather expect if we hadn't had the earthquake that they wouldn't even have an office or if they did, it would probably be the additional duty of someone in the police department or fire department.

Council also revised its pre-disaster stance and approved the CD director's request for an assistant to handle inventory and control, and assist with coordination and public relations. The earthquake experience demonstrated the need for such aid. The relief effort had been hampered because no one had previously had much time to devote to acquisition and distribution

of Anchorage CD supplies and equipment. Much had been lost or was in unknown condition. Also, there had been no back-up person for the CD director.

Another change, which occurred on January 5, 1965, was city council's creation of a civil defense and disaster board -- which was recommended by the city manager. Seven leading citizens were appointed to serve on this body. The man who was mayor when the earthquake struck was appointed chairman. The civil defense director served as executive secretary. The board's function was to advise the mayor and council about the city's civil defense problems and needs.

After the earthquake, the CD director published a Greater Anchorage Civil Defense basic plan. This plan outlined in very general terms the authority and responsibilities of the director, the nature of the emergency CD structure, and the tasks and functions of its operating units. For example, the plan called for health and medical functions to be carried out by the Greater Anchorage Health District.

The plan was so general that it would not be very useful unless it was followed up by more specific plans. It did not seem to be widely distributed. Many officials who supposedly were to perform key civil defense roles were unfamiliar with it. However, these problems may have been worked out since the time we completed our research in Anchorage.

The civil defense director also devised a procedure whereby certain key city employees such as department heads were assigned specific places to report if another disaster struck. And a year and a half after the earthquake civil defense officials were involved in a project to provide identification cards for city employees who possessed relevant emergency skills.

Another civil defense change occurred because of the problems that organizations and groups encountered when they attempted to coordinate their activities during the disaster. Telephone service was disrupted for a considerable period, and intra- and interorganizational communications were carried out mainly by runner or radio. Runners were relatively slow and many organizations did not initially have radios at their disposal. Some organizations with radios could not communicate with others because they were on different frequencies.

As a result, a civil defense emergency communications network was installed in Anchorage in April 1965. The control station was located in CD headquarters. The equipment, purchased by local civil defense on a matching funds basis, included eleven battery operated mobile transceivers.

The transceivers were assigned to key city personnel and departments: the city manager, the mayor, the local CD director, assistant director, information officer, communications officer, the police department, the fire department, and the municipal light and power department. Two transceivers were placed in reserve -- one for use by emergency rescue groups and one to replace any malfunctioning set. A test of this system was conducted every week.

Providence Hospital, the largest in the community, was given a communicator which tied into the emergency radio network. A communicator was also made available to KFQD. Somewhat later, the Alaska State Civil Defense Department was given a communicator which also tied into the emergency radio system.

The earthquake, therefore, demonstrated the need for a reliable back-up system for interorganizational communications. In response to this need, the CD emergency network was established.

The final change in local civil defense also involved emergency communications. During the emergency period, civil defense was considerably assisted by a number of citizen band radio operators who volunteered their services and equipment. No formal agreement for such aid had been made prior to the disaster. In developing a community shelter program after the earthquake, the CD director remembered the value of their contribution. He made a formal agreement with a newly formed radio club, in which a radio operator was assigned to each shelter. This resource would be used in the event of a nuclear or natural disaster.

Red Cross South Central Alaska Chapter

Pre-disaster Structure. -- The headquarters of the South Central Alaska chapter of the American National Red Cross was in Anchorage. The chapter's organization followed the usual pattern and was supported by local contributions and resources. Its executive secretary and a secretary were the only paid personnel; the remainder were volunteers. Because this chapter's jurisdiction covered 65,000 square miles there were representatives in outlying communities. They reported to the Anchorage headquarters and made available to their respective areas such Red Cross services as disaster relief and home service.

The chapter's board and executive committee met monthly to discharge South Central's business. Other committees handled Red Cross programs such as nursing, water safety and first aid, and disaster preparedness.

The disaster committee was headed by a local volunteer who had considerable experience in civil defense work. The committee was responsible for surveying the community to determine the kind of disaster planning needed. Following a disaster, this committee was expected to organize shelter operations, food and clothing distribution, emergency medical care, and handle welfare inquiries. The disaster committee guided by its chairman, then, was expected to be the key to the emergency response of the local chapter in the event of a disaster.

The local chapter was expected to use its resources primarily to meet immediate emergency relief needs. Representatives of the larger American National Red Cross organization, as they arrived in the community, were expected to focus primarily on long-term family rehabilitation.

The South Central Chapter was within the jurisdiction of the Red Cross Pacific Area which has its headquarters in San Francisco. Area officials did not consider the chapter to be a particularly strong one. Approximately two years before the earthquake, they had made an attempt to strengthen its disaster preparedness program.

Long-term Change. -- The South Central Chapter did not respond as quickly as it was expected to following the earthquake. The disaster chairman did not bring together the members of the disaster committee and it did not fulfill its expected functions. Moreover, the executive secretary did not organize a disaster operation during the crucial period following the earthquake.

The disaster chairman did not function as such because of a stronger commitment to another role. Throughout the emergency period he worked at the local hospital where he was employed. The chairman's multiple organizational membership, therefore, was a latent source of strain for the chapter which became manifest after the earthquake.

The chapter's lack of an organized disaster effort caused considerable concern to Pacific Area Red Cross staff who came to Anchorage after the disaster. As one official observed:

I would say that if this disaster proved one thing it has proved . . . to us that any chapter should have a disaster committee well organized with somebody ready to take care of food and clothing, shelter, and make arrangements for supplemental emergency medical care. Without this basic organization in a chapter very valuable time is lost because the first few hours are critical in terms of getting into operation, letting the public know who you are, what you can do. Unfortunately, time was allowed to elapse before this was accomplished.

Pacific area personnel remained in Anchorage for several months after the disaster to provide rehabilitation assistance. During this period they worked with the local chapter to try to strengthen some of its weaknesses -- especially its disaster program. Thus, they supplied a form of greater external support which helped to bring about changes in the chapter.

The disaster committee was reorganized. A new chairman was appointed and a co-chairman was named in order to provide back-up leadership. Each of the following functions was assigned to a specific person -- emergency communications, transportation, volunteer services, supply, and public relations. Responsibility for mass care was delegated to three people.

The reorganization of the disaster committee can be interpreted as the organization's attempt to enhance its effectiveness in responding to emergencies and as a means of adjusting to the strain resulting from the disaster chairman's multiple organization membership.

Preexisting Patterns of Change Accelerated
by Internal Conditions

The Anchorage Municipal light and Power Department was the only organization which had pre-disaster patterns of change hastened by internal factors, without also having new patterns of change evolve.

Anchorage Municipal Light and Power Department

Pre-disaster Structure. -- The municipal light and power department (ML&P) was headed by a manager who was responsible to the city manager. A chief electrical engineer was second in command. The department had 50 employees and 5 divisions: accounting and service, operations, engineering, construction, and sales (see figure 5). In recent years ML&P averaged over 8,000 customers, most of whom lived within the Anchorage city limits.

The department received power from its own 2 turbine generators and 6 diesel engines, and from a U.S. Bureau of Reclamation hydroelectric plant. Each generator had a 14,000 kilowatt capacity and could use either gas or diesel oil. The second dual fuel generator had been installed a little more than 2 weeks before the disaster. Each of the 6 diesel generators had a capacity of 1,000 kilowatts. The Bureau of Reclamation plant at Eklutna, 50 miles from Anchorage, had a contract to supply ML&P with an additional 16,000 kilowatts.

The department had no written disaster plan. Officials believed that departmental personnel were geared to emergencies as a matter of routine. For example, they felt that an effective pattern of response had evolved among the emergency crews because of the vulnerability of the power system to the elements, which resulted in frequent minor crises.

All 16 of its vehicles had mobile radios. The department also had a radio link with the Eklutna station and with the Chugach Electric Association, operators of the other major power system in the Anchorage area.

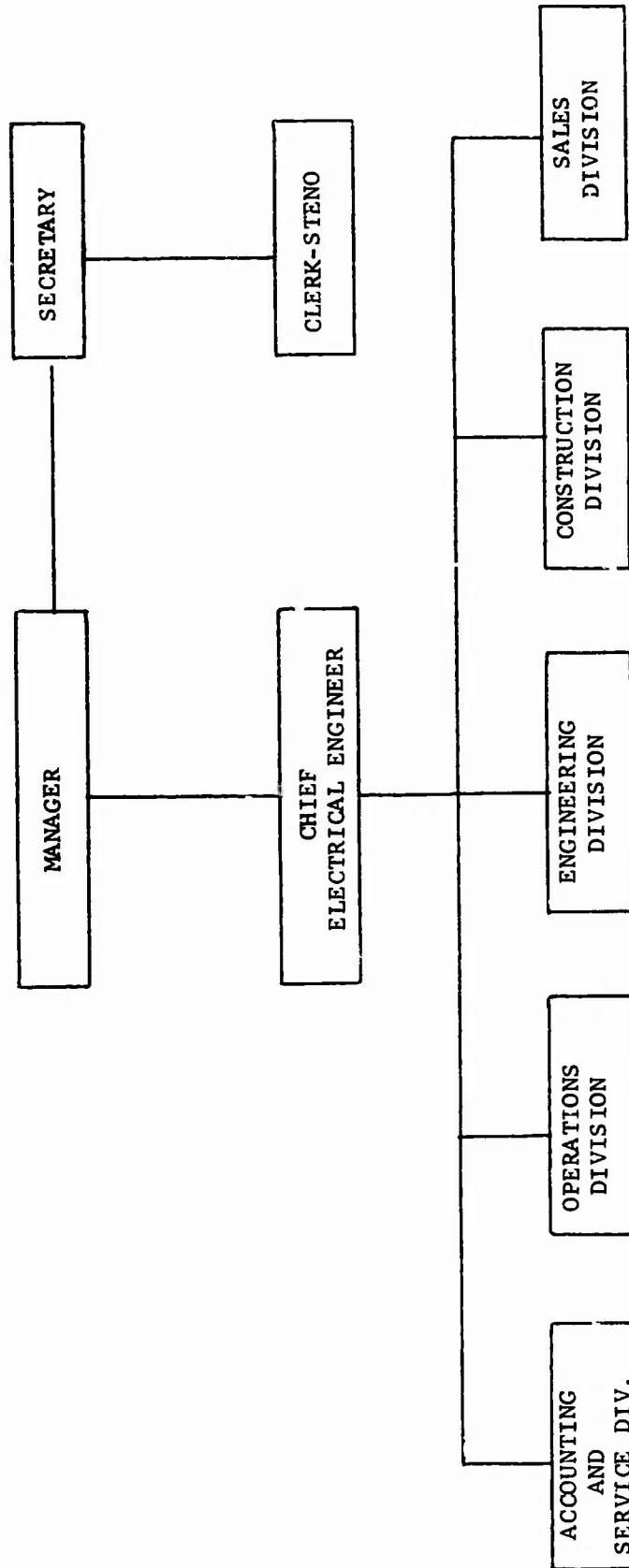
Long-term Change. -- Officials reported that a technical modification in the power system which had been considered before the disaster had been, in part, accelerated because of the earthquake experience. This modification was in the process of being completed a year and a half after the disaster. It involved installing equipment to divide the city's transmission system into four areas, each of which could be isolated from the others in the event of difficulty. This will mean that a power outage in one area will affect only that area and thus can be restored more rapidly.

Comparing this new capability with what existed at the time of the disaster, one official observed:

If we'd had that separation we could have cleared up trouble after the earthquake in pieces and put it back one by one rather than having to

FIGURE 5

ANCHORAGE MUNICIPAL LIGHT & POWER DEPARTMENT



go through the entire area to see that all your trouble was cleared before you could restore service to the city.

Preexisting Patterns of Change Accelerated by External Conditions

In this section, we will discuss the two organizations -- Northern Television, Inc., and radio station KBYR -- which had prior existing or latent patterns of change accelerated by external conditions created by the earthquake. External organizational support and other disaster related circumstances led to some change in these two organizations.

KBYR Radio

Pre-disaster Structure. -- Radio station KBYR in Anchorage had an affiliated station in Fairbanks -- KFRB. The station was operated by thirteen persons: a general manager, who was responsible for overall operation; a newsman; five announcers; a sales manager and two salesmen, and three secretaries.

Northern Television, Inc.

Pre-disaster Structure. -- Anchorage television station KTVA and station KNIK-FM were owned and operated by Northern Television, Inc. KTVA, the first TV station in Alaska, began operating on December 11, 1953. In 1960, KNIK-FM was established and was the first "good music" station in the state. The corporation also owned KTVF, a television station in Fairbanks. A president and general manager supervised the operation of the Northern Television, Inc. stations.

Long-term Change. -- For a number of years Northern Television had been interested in expanding its broadcasting operation to include AM radio. There had been a number of negotiations in the five-year period before the earthquake with the owner of radio stations KBYR in Anchorage and KFRB in Fairbanks who was interested in selling the two stations. No agreement had been reached. The earthquake was responsible for bringing about the circumstances which eventually led to Northern Television's purchase of the two radio stations.

The earthquake caused considerable damage to the building where the Northern Television studios were located in Anchorage. The Small Business Administration gave the corporation a disaster loan to construct a new building for its studios and to replace some equipment.

Stations KBYR and KFRB were still available for purchase at the time. Encouraged by the loan and the prospect of setting up a new operation in Anchorage, Northern Television officials decided to make the acquisition.

A second factor was also involved in the decision to buy the stations at this particular time. Because of the possible navigation hazard, the Federal Aviation Agency had to endorse the construction of a broadcasting tower on the site the corporation chose for its new facilities. One solution was to purchase KBYR because its location was already approved by the FAA.

There was, then, a definite relationship between the disaster and the change which occurred, i.e., the change in ownership of the two stations. The conditions which followed the earthquake were responsible for this change occurring at a particular point in time. Northern Television officials reported that had the disaster not occurred they would not have purchased any AM radio stations until some later period.

New Patterns of Change Initiated and Preexisting Patterns Accelerated by Internal Conditions

New patterns of change were initiated by internal conditions, and pre-existing patterns were accelerated as well in the Chugach Electric Association.

Chugach Electric Association

Pre-disaster Structure. -- The Chugach Electric Association (CEA) is a member-owned cooperative financed by the Rural Electrification Administration. It was founded in 1948 to provide a source of central station power for people living outside of Anchorage.

Of the 15,000 consumers served by the association, about 6,000 resided within the Anchorage city limits. In addition to its retail sales, CEA sold wholesale power to areas such as Seward and the Kenai Peninsula.

From among the membership, the members of the cooperative annually elected a seven-man board of directors. The directors appointed a general manager who was responsible for operations. His staff consisted of a staff assistant, a legal counselor, and managers of the four departments -- office service, operations, engineering, and production.

Chugach Electric operated three plants -- the Knik Arm plant in Anchorage, and the Bernice Lake and Cooper Lake plants on the Kenai Peninsula -- which had a combined capacity of over 37,000 kilowatts. The association, like the municipal light and power department, bought power from the Eklutna Bureau of Reclamation plant. This source supplied 9,000 kilowatts.

The lines of the three power systems were joined in one substation owned by the bureau, thus enabling the transfer of power between them. There had been times prior to the earthquake when CEA and ML&P found it necessary to borrow power from each other.

The Chugach Electric Association did not have a written disaster plan but standard procedures and routines had been worked out due to the frequent occurrence of power emergencies. One official reported that an average of two complete area power outages a year were experienced due to climatic and geographic conditions and because the systems were still in the process of being developed.

Long-term Change. -- Two relatively long-term changes in the association followed the disaster. The first was a change in the decision-making pattern. Before the emergency the board of directors had begun to allow the general manager and his staff considerable autonomy in managing the organization. After the disaster, however, the board returned to a previous policy in which it was more directly involved in operations. One example was that the staff needed the board's approval more often before making major expenditures.

Officials attributed this change to circumstances following the earthquake. The disaster precipitated a critical period for CEA. Key decisions about the rehabilitation of facilities and plans for future development had to be made. It seems that within this context the board became more concerned about operations, which reversed the trend toward increasing autonomy for the management staff.

The earthquake was also responsible for CEA accelerating plans to add new generating facilities in Anchorage. The organization's transmission line from facilities on the Kenai Peninsula into Anchorage was considerably damaged. Officials determined that it would be years before the line could be repaired and used. To offset this loss of power, pre-disaster plans to install two large turbines in Anchorage were considerably advanced.

New Patterns of Change Initiated and Preexisting Patterns Accelerated by External Conditions

In this section we will discuss changes in the Anchorage Port Department. New patterns of change were initiated by external conditions and pre-disaster plans were hastened by them.

Anchorage Port Department

Pre-disaster Structure. -- The department maintained and operated the city-owned port facilities. The director was in charge of overall

administration of the department and port. His staff was composed of a terminals manager, business manager, two pier foremen, two accounting clerks, and a secretary.

The port was located at the head of Cook Inlet about a mile from downtown Anchorage. Major facilities consisted of a single berth dock and an industrial park where the city leased land to businesses. The dock was completed in 1961 but no regularly scheduled carrier used it.

Shipping has long been one of the most important means of transportation in Alaska, mainly due to the inadequacy of other modes of travel. Seward and Whittier were the state's major ports because they were located on Prince William Sound which was ice free the year around. Shipping companies operating out of the state of Washington usually sent goods to these ports. From there, cargo was transported to the interior, and even to Anchorage, by The Alaska Railroad.

The Port of Anchorage operated at a financial loss because it lacked carrier service. Shortly before the earthquake, however, city officials were negotiating with a major carrier for weekly service. They knew that much more business would have to be attracted, though, before the port could operate at a profit.

Long-term Change. -- The ports of Anchorage, Seward, and Whittier were all affected by the disaster. However, damage was much more extensive at the latter two. Docking facilities were virtually destroyed at Seward and were considerably damaged at Whittier. Petroleum storage tanks were heavily damaged in both cities.

In contrast, the Port of Anchorage fared much better although it sustained some damage. Emergency repairs were begun quickly and three days after the disaster the facility was able to receive its first vessel.

A few days after the earthquake, both emergency and nonemergency shipping, which normally would have gone to the other ports, began coming to Anchorage. This included oil tankers from companies that had petroleum storage farms at Seward and Whittier. To cope with the increased oil shipments, a temporary petroleum berth was completed in July 1964. Largely because of the disaster, then, Anchorage became the shipping center of the state, handling more tonnage than any other terminal.

Since the Port of Anchorage was the only such facility operational for some time after the disaster, Shell and Standard increased their storage facilities, and Union Oil and Texaco constructed new installations in the industrial park. These facilities -- many of which replaced those destroyed at Seward and Whittier -- increased the port's storage capacity by 290 percent.

Not all of the increase in shipping was attributable to the disaster. There was also an increase in general cargo handling. For the most part, this was because Sea-Land, which had been negotiating with the city prior to

the earthquake, decided to continue with its plans to supply regular shipping service to the port. In fact, because of the serious transportation problems following the disaster, the carrier began its operations in May rather than June as originally planned. Sea-Land also made shipments during the winter, the first time such a feat had been carried out. With the increase in petroleum and in general cargo shipping, city and port officials were optimistic that the expanded port operation would continue beyond the reconstruction period.

The dramatic effect that the post-earthquake situation had upon the fortunes of the port is indicated by comparing tonnage figures for the first three years after the dock facility was opened with figures for 1964, the year of the disaster (see table 2).

TABLE 2

PORT OF ANCHORAGE TONNAGE FIGURES

	<u>General Cargo</u>	<u>Petroleum</u>
1961	38,259	(no figures given)
1962	44,575	52,888
1963	97,507	98,903
1964	159,608	656,009

(From Port of Anchorage public information brochure)

The table shows the substantial increase in general cargo handled in 1964 and the even greater increase in petroleum tonnage. It is apparent that the entire increase cannot be attributed to the earthquake; however, it is just as obvious that much of it has to be so attributed. Although no figures had been released at the time this study was completed, port and city officials expected the tonnage handled in 1965 to be even greater than in 1964.

Port programs conceived prior to the disaster were now implemented much sooner than expected for two related reasons. The use of its facilities increased and it operated for the first time without a loss.

The surge in shipping made the single berth dock inadequate so city and port officials pushed ahead with plans to enlarge the port. The new financial status gave officials confidence that the citizens of Anchorage were prepared to support such plans. Accordingly, a \$2½ million general obligation bond issue was put before the city voters on March 9, 1965. The bond issue passed and a permanent petroleum dock was completed in November 1965.

Before the new dock was completed, officials felt that it would not be sufficient to handle the expanded activity. Therefore, in October 1965 a second bond issue twice the size of the first issue got voter approval. It was being used to construct a second dock which was scheduled for completion sometime in 1967. Thus, programs for the physical expansion of the Port of Anchorage, which were probably years away, were catalyzed, at least in part, by the circumstances following the disaster.

The expansion in port operations was responsible for some modification in the structure of the department's small staff. One new position was established and some responsibilities were realigned. Shortly after the disaster, the position of port engineer was created. His duties included preventive maintenance and various engineering planning functions. Before the disaster, the terminals manager maintained the port facilities.

The position of terminals manager was reclassified and renamed operations and sales manager. He was in charge of sales promotion and overseeing the cargo handling -- formerly the terminal manager's duty. An additional utility man and a secretary were hired.

According to the respondents, these changes had been anticipated before the earthquake. Because of the increased port activity they were implemented sooner for the sake of greater operational efficiency.

One of the latent consequences of the expanded port operation was the increased formalization which developed. Standard operating procedures evolved in areas where they had been lacking prior to the disaster. For example, written procedural files covering several aspects of port activity were instituted. A much greater emphasis was placed on maintaining records.

At this point, let us recapitulate. Anchorage -- the economic and population center of Alaska -- was the destination for many of the commodities shipped to the state from the "lower forty-eight." Before the earthquake its port lacked the facilities to compete successfully with the ice-free ports of Seward and Whittier.

The disaster assisted in creating circumstances favorable to the expansion of the port. It modified the environment in which the port department had to function. The facilities at Seward and Whittier were destroyed or heavily damaged so port officials in Anchorage were able to pursue their plans without competition. Thus, they were able to accelerate plans for both structural and physical changes in the port. Such changes had been viewed as being years in the future.

New Patterns of Change Initiated and Preexisting Patterns Accelerated by Both Internal and External Conditions

As table 1 indicates, the Anchorage Public Works Department and the Alaska State Civil Defense were the only two organizations in which a

combination of internal and external factors initiated new patterns of change and also accelerated preexisting patterns. We will consider these two organizations in this section, which will conclude our discussion of organizations that experienced some long-term adaptation.

State of Alaska Civil Defense

Pre-disaster Structure. -- The State of Alaska Civil Defense, a division of the Alaska Department of Public Safety, had its headquarters in Anchorage. Seven of the eight permanent staff members worked at headquarters; a deputy director was stationed in Juneau.

The Alaska civil defense director was appointed by the governor and was directly responsible to the commissioner of the department. The remainder of the staff was under civil service.

An assistant director-administrative officer was second in authority. He was in charge of administrative matters and assumed command in the absence of the director. Under him were the operations, resources, and training officers. The remainder of the staff consisted of a secretary and a clerk-typist.

The organization was understaffed at the time of the earthquake which partly explained why employees spent much time on activities other than those suggested by their official titles. For example, the training officer spent more time directing the state's public shelter program than on CD training activities. The resources officer was more involved with projects such as developing emergency plans than in CD resource matters. Employees, then, had to be versatile since they were often engaged outside their particular specialties. The governor, a strong supporter of civil defense, had urged the state legislature to provide for a larger CD organization.

The other state departments had been assigned emergency civil defense functions and specific officials from each were designated as civil defense coordinators. By order of the governor, these officials were to work under the direction of the state civil defense director during periods of emergency. Thus during a disaster the state civil defense organization could be expanded to include representatives of the state departments who would coordinate the activities of their respective organizations with the overall disaster effort. There had never been an occasion for the state civil defense organization to increase in size in this fashion. However, at times, the assistance of a number of these state officials had been utilized by the permanent state CD staff.

Its primary function was to serve as a coordinating body, so state civil defense worked with many types of organizations in administering federal programs and planning for disaster. Some were organizations such as the Civil Air Patrol, the Red Cross, and the military. They had cooperated with

the Anchorage Civil Defense Department until its director resigned. The state CD staff also worked with various federal agencies that maintained offices in Alaska, as well as with state agencies. Joint meetings with federal and state officials were held several times each year during which disaster plans were outlined and various problem areas were considered. State civil defense had written agreements for cooperative action during emergencies with the Corps of Engineers, Alaska District; the Civil Air Patrol, Alaska Wing, and the American National Red Cross.

In the Corps agreement, state civil defense officials can seek assistance when local and state resources are no longer available. In such instances, the district engineer was authorized to use the resources of the Corps whether the cause was a flood or some other type of natural disaster. The agreement with the Civil Air Patrol read in part:

During a Civil Defense emergency declared by the governor or the director of Civil Defense, the Alaska Wing, Civil Air Patrol, will employ its facilities, personnel and equipment to support the division of Civil Defense consistent with its mission as a volunteer civilian auxiliary of the United States Air Force.

The written agreement with the Red Cross said in part:

The ANRC and Alaska Division of Civil Defense have a close working relationship in natural disaster. Therefore, ANRC Pacific Area and Alaskan Chapters will plan and act in unison with appropriate provisions of the current Alaska Civil Defense plan including those of the several State departments and incorporated municipalities, pertinent federal statutes, and this agreement.

Both the Red Cross and the Civil Air Patrol agreements became effective in 1962. All three agreements served as the basis for cooperation following the 1964 earthquake.

State civil defense officials perceived their role to be planning and developing an effective organization which could assist communities in Alaska in meeting either man-made or natural disasters. But most of their planning was oriented toward war-caused emergencies. For example, the public shelter, training, and public warning programs were developed in anticipation of a nuclear attack. This emphasis mainly resulted from the federal government stipulation that funds given to states for their civil defense organization must be used for these kinds of programs.

Another factor that hampered the inclusion of natural disasters within the scope of state CD's responsibilities was that the organization had no statutory basis for expending state funds for such operations. State CD officials hoped that such a law would sometime be passed.

Along these same lines, officials wanted to change the organization's name to Alaska Disaster Office so the public would recognize and come to support the notion that it had a function other than war recovery. It was

generally felt that the civil defense label was misleading and did not suggest the total function of the organization.

Although hindered by a lack of funds directly usable for natural disaster planning and operations, state civil defense had been involved in several small natural emergency operations. During the spring, some rivers frequently flooded, requiring the evacuation of nearby villages. On several occasions, state CD staff members cooperated with the Red Cross, the Corps of Engineers, and the military in evacuating, housing, and feeding the flood victims.

When the earthquake struck, state civil defense did not have a completed disaster plan. A plan was published in 1958. However, some years later, it was adjudged to be outmoded and the staff decided to rewrite it. A revised rough draft of the earlier plan was made in 1962, due in part to the anxiety generated by the Cuban crisis. The CD staff was to write the basic state disaster plan. Each state department would write more specific plans, called annexes, which would complement the general guidelines established by the basic plan.

There had been meetings between the CD staff and officials of various state departments regarding disaster planning. The original goal of one meeting a month did not come about because many departments were not highly interested. Some were reportedly working on their phase of the plan but very few had completed it.

State civil defense's back-up communication capability was provided by licensed ham radio operators who were members of the local group of the Radio Amateur Civil Emergency Service (RACES). The Anchorage RACES organization was supervised by the state RACES director, a volunteer appointed by the state CD director. The fifty members were considered volunteer state civil defense personnel.

Meetings were held three times a week in their headquarters in the basement of the state civil defense building where their radio equipment was kept. Some of the equipment such as the twenty-two mobile radio units was purchased by state CD with federal funds.

The RACES volunteers conducted periodic drills to prepare for any emergency in which they might be called upon to assist. Oddly enough, two years before the earthquake they simulated one. During the exercise, mobile radio units were dispatched to the police department, the hospitals, and the city civil defense headquarters. This procedure was repeated following the real earthquake.

The only time that the group had completely mobilized for an actual emergency was during the Cuban crisis. During this period, a twenty-four hour alert was maintained for several days.

A few weeks before the disaster, the state civil defense organization was in danger of losing its financial support from the state legislature. Because of this, its personnel became involved in a campaign to publicize the function of the organization and to make the public aware of why it was needed. Staff members appeared on radio and television, and articles were released to the newspapers. Civil defense in Alaska, then, was experiencing difficulties prior to the March 1964 earthquake.

Long-term Change. -- On July 1, 1964 the Alaska State Civil Defense organization was renamed the Alaska Disaster Office.* It was hoped that the new name would more accurately convey to the public the actual and broader function of the organization.

There were a number of noteworthy long-term changes which emerged from the earthquake experience. Some of the patterns of change existed in the organization prior to the disaster and were somehow accelerated by it. Also, new patterns of change were initiated by it.

The disaster was a learning experience for the organization. Consequently, in assessing its performance, the members identified a number of problem areas which had developed. Some of the changes made were based on the desire to control such problems so that future disaster responses would be more effective.

Analyzing the changes from another perspective, we note that some were primarily determined internally. That is, persons within the organization had the authority to initiate and implement them without having to seek the approval of external sources of authority. However, external approval and support was required for a number of changes.

In some instances the disaster seemed to provide evidence which strengthened the disaster office's contention that certain of its programs should be supported. One result of the disaster, then, at least for a short period, was that the organization had greater control over an important part of its environment -- that aspect which determines the resources it will be allocated. Let us now consider more specifically the disaster related long-term changes which occurred in the Alaska Disaster Office.

In the pre-disaster authority structure, the director was the top official and the assistant director-administrative officer was second in command. The other three nonclerical members -- the operations, training, and resources officers -- were on a common level in the organization and under the assistant director. Having had no previous major disaster experience, the effectiveness of this structural arrangement under such conditions was unknown.

*Throughout the remainder of this monograph we will refer to this organization as the Alaska Disaster Office (ADO).

As Alaska Disaster Office officials began setting up their operation during the emergency period, they perceived their problems to be of two sorts. First, the need to coordinate emergency rescue and relief activities became apparent. Secondly, they had to handle the administrative work related to acquiring federal disaster assistance for the affected communities in the state.

Accordingly, the work assigned to staff members was so divided. The director and assistant director began working on the administrative phase of the organization's emergency response. The operations officer was given a free hand to deal with the operational aspect. The resources and training officers were assigned to work under the operations officer.

The structure of the regular Alaska Disaster Office staff, then, differed from its organization prior to the disaster. In referring to an earlier period when the new arrangement had not yet emerged, one official noted:

Well, early experience in the quake indicated that this the pre-disaster structure was just not too functional because we had an operations officer, but he was all by himself. He had no one actually working for him. Resources was helping him, but he was not under him. So we then took another look at our organization and we split it up to two particular sections within the . . . division.

Since the new structure was defined as more satisfactory than the pre-disaster pattern, it was made a permanent feature of the organization. Thus, what was initially perceived as an emergent pattern to cope with the emergency contingencies became a relatively long-term arrangement. Let us look more closely at it.

First, the responsibilities below the director were divided between the assistant director and the operations officer who were now on the same level. The assistant director was in charge of the administrative section and the operations officers headed the operations section.

Both the positions of resources officer -- later redesignated assistant operations officer -- and training officer became part of the operations section. In the pre-disaster organization the training and the resources officers were on the same level as the operations officer.

The administrative section came to include a supply officer and an assistant operations officer. The assistant operations officer in this section became routinely involved in administrative tasks; therefore, his designation was misleading. The position was so labeled to avoid establishing a new civil service classification. Both positions were new ones which the Alaska Disaster Office was able to add as a result of the disaster. With regard to the position of supply officer one official observed, "during the quake it was very clear we needed a supply officer, somebody who devoted full time to this. Would know where these supplies were, to handle the paperwork involved. . . ."

The organization was also able to add two more clerical persons to the staff, a secretary and a clerk-typist. Thus, by the summer of 1964, the staff had increased by four persons. In attributing this overall increase in personnel to the disaster, one official said:

/We/ went over this organization and we came up with this recommendation. /The director/ in turn then recommended it to /the commissioner/ who approved it. It's the best thing we've ever gotten through in our life, through with no sweat, and this was directly due to the quake because we had no intentions whatsoever of increasing our staff.

There was one case of inadequate role performance on the part of a member of the regular Alaska Disaster Office staff during the emergency period following the disaster. For purposes of anonymity, we will use the fictitious title of plans officer when referring to this person. There was some question about the plans officer's work prior to the disaster. However, dissatisfaction with his performance reached the critical point following the earthquake. For example, one person noted:

- . During the quake we'd look for him and there'd be periods of an hour, two hours, when we just didn't know where he'd be. He'd come back and have no logical explanation of where he'd been. He was logically the one who should have taken over the fuel coordination. I assigned it to him, but he was incapable of handling it. He didn't have the ability to see what had to be done and then go ahead and do it.

Because he was not performing his role as expected, the plans officer was informed during the emergency that he was being discharged effective as of the end of April. Later, this was temporarily reversed. However, during the first week of July 1964, he resigned by "mutual consent."

His resignation might have occurred eventually even without the disaster because of the earlier dissatisfaction with his performance. Yet the resignation came when it did because the demands of the disaster made his below par work even more critical and apparent.

Under more stable conditions, organizations can use various devices to control, to some extent, the dysfunctional consequences of inadequate role performance; for example, by not assigning important work to those persons who are defined as performing under par. During periods of crisis, however, control devices sometimes break down and latent problems become manifest. It is our contention that the inadequate role performance of the plans officer, as defined by Alaska Disaster Office officials, was a source of strain for the organization. The removal of the role incumbent was the means used in adapting to this strain.

When the Alaska Disaster Office staff was reorganized, there was also a greater delegation of responsibility and increased formalization. For example, some staff members thought that prior to the disaster the director supervised their work too closely, which created a morale problem. It was reported that this situation was reversed following the disaster. Evidently,

the change was partially due to the modification in the interpersonal patterns of the organization caused by the addition of new personnel. There seemed to be a considerable amount of confidence placed in some of the new role incumbents.

There was also a more specific assignment of tasks after the reorganization. For example:

Prior to the quake it seems like everybody did a little bit of everything. We still do but we have now made specific assignments to individuals -- this is the responsibility of a given individual. He may get assistance from someone else but we look to this individual for the accomplishment of this program and prior to the earthquake it wasn't that formal.

Thus, one result of the earthquake experience for the Alaska Disaster Office was that some new patterns emerged with regards to the delegation of responsibility and the assignment of tasks.

Another effect of the disaster was the stimulus it provided to complete the lagging disaster plan. It was published in February 1965. The plan was geared toward nuclear disaster, but the officials thought it would also provide guidelines for natural disaster operations.

Prior to the earthquake, work had also been started on a state seismic sea wave warning plan. The plan was published in September 1965. As one ADO official said, "It /the earthquake/ certainly stimulated getting it out. It pointed up the importance of the plan and I think it's coming out a year earlier than it normally would have."

A few changes in the Alaska Disaster Office's physical facilities took place. In the summer of 1964 the state legislature appropriated \$25,000 to purchase radio equipment to establish an emergency communications system throughout the state. By the fall of 1965, the equipment for this new capability included a 1,500 watt base station with auxiliary power to be installed in Juneau, Anchorage, and Fairbanks; three 150 watt transceivers which can be taken to disaster areas for emergency communications; and a number of 5 watt mobile units and walkie talkies. Relating the acquisition of this equipment to the earthquake experience, one Alaska Disaster Office official said:

This is a direct outcome of the earthquake. We had attempted to acquire such a system for three years and had always been rejected. We went in with the supplemental one -- the emergency portion of our budget -- and it was approved without any question.

Another physical resource change was the acquisition of a new office. This grew out of the serious problem that developed during the disaster when the expanded staff was seriously hampered by the lack of sufficient space. The 20-foot by 80-foot headquarters was too small and four mobile homes had to be used.

After the disaster a twenty-four foot by sixty-foot redwood building was donated to the state for use by the Alaska Disaster Office. Local contractors and labor unions provided some materials and labor, and the building was erected adjacent to the headquarters building to provide additional office space.

Our data, then, indicate that the Alaska Disaster Office underwent a number of long-term changes which were related to the earthquake experience. Some were structural; others involved the replacement of role incumbents or the addition of personnel. Still others concerned the physical resources available.

The disaster created a climate in which the Alaska Disaster Office received an unusual degree of support from other organizations and agencies. In this respect it had a measure of control over its environment that was absent during more stable periods. For several months after the disaster the Alaska Disaster Office was able to request and did, in fact, receive an unusual amount of cooperation and support for its programs. For example, one official during this period made the following observation:

It's just like turning 180°. . . . The close cooperation we now have with other state agencies and other federal agencies, the increased stature that we have gained as a result of it and as a result of this we're able to work a lot better with other agencies and they with us. . . . It'll probably take us two or three years of nothing where civil defense will slip into the background like it was before. So there's been irrevocable changes. In fact, friends of mine have accused me of engineering the earthquake.

Anchorage Public Works Department

Pre-disaster Structure. -- With 169 employees, public works was the largest city department. The following were its major assigned functions at the time of the earthquake: the maintenance of streets, sewers, and city buildings; the design and construction of streets, and water and sewer lines; the maintenance and operation of the municipal airport and water utility; traffic engineering; and building inspection.

The director of public works, who also served as city engineer, was directly responsible to the city manager. His assistant was also the assistant city engineer.

The department had six divisions and the heads of the divisions reported to the director. The assistant director was in charge of the engineering division, a chief building inspector was head of the building inspecting division, a traffic engineer supervised the traffic engineering division, an airport manager supervised the airport division, a water utility manager was head of the water utility division, and a superintendent of public works

was responsible for the maintenance division. (Figure 6 outlines some of the major pre-disaster structural features of the organization.)

The public works department did not have a disaster plan. Many of its employees, however, had special skills and experience relevant to emergency rescue and restoration activities. For example, personnel in the maintenance and water division coped with minor crises in connection with their work. Employees such as those in building inspection, engineering, and maintenance possessed skills which could be utilized to lessen the danger of a secondary disaster. The department had internal resources -- heavy equipment, emergency parts, etc. -- which would be vital during a disaster.

Long-term Change. -- Following the earthquake the public works department underwent considerable change. Some of the modifications can be partially attributed to the disaster experience.

The data clearly indicate that several changes might not have occurred when they did had it not been for certain pre-disaster characteristics and circumstances. It also seems fairly evident that if the disaster had not happened, some of these modifications would have taken place eventually. Thus, in many respects, the earthquake functioned as a catalyst; that is, certain pre-disaster processes of change were accelerated by conditions which prevailed after the disaster.

At the time of the earthquake, the department was going through a period of reorganization so it was in a state of considerable flux. A number of changes had been instituted several months before the disaster and many more were anticipated by officials. The changes had been made in order to use resources more efficiently.

In addition, there were some areas of strain and tension which were partly responsible for some changes which later emerged. The director and his assistant were expected to administer an organization consisting of several units with highly diversified functions. At the same time they were expected to function in specialized engineering roles. This situation created certain problems and provided the context in which some long-term organizational adaptations emerged.

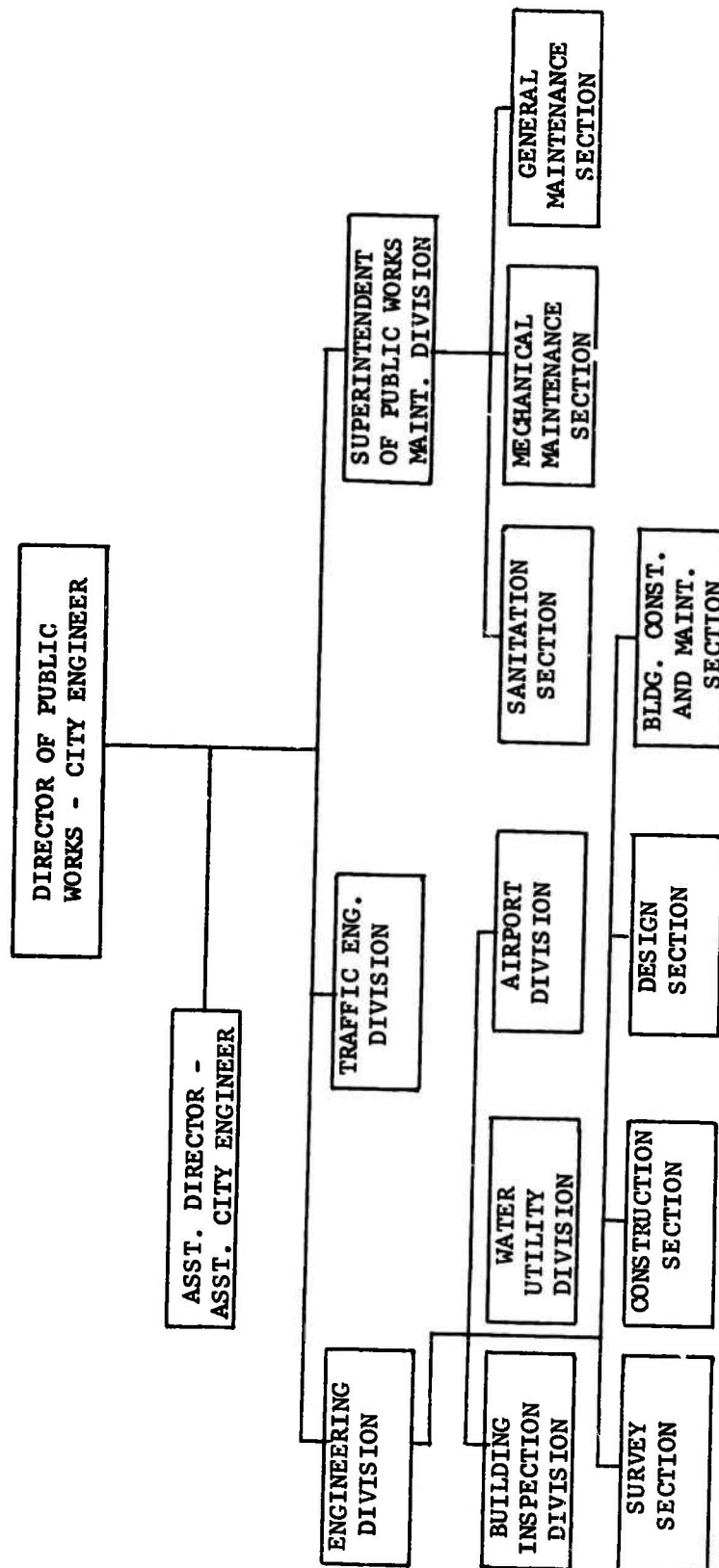
The major disaster related long-term changes involved the water utility division, traffic engineering, building inspection, engineering, and building construction and maintenance.

Water division. -- On October 13, 1963, the water division was formed within the public works department. It was thought that a centralized operation would provide more adequate service for the increasing number of customers. Previously the responsibilities of the utility were divided among several municipal agencies.

The division had twenty-five employees before the disaster, supervised by a utility manager who reported to the director of public works. Plans called for developing the water utility into a separate department over a period of several years as the operation expanded, with its manager reporting to the city manager.

FIGURE 6

ANCHORAGE PUBLIC WORKS DEPARTMENT



Because of the earthquake, the development of the water division was accelerated, bringing it closer to the time when it would operate as a separate unit. The division acquired more responsibilities and created a few additional permanent positions.

In this regard, prior to the disaster the public works engineering division met all the engineering requirements of the utility. In November 1964, the utility partly took over this job when it established the beginnings of an engineering section by adding an engineer and draftsman to its staff. The position of engineer was also established in order to have an administrative assistant to back up the utility manager.

The expanded operation was needed in order to (1) restore the damaged and destroyed portion of the water system, and (2) to meet new requirements for continued service such as providing water for pre-disaster customers who were forced to move into areas which previously received no water service. Since many of these changes were scheduled for some later period anyway, the officials decided to continue them beyond the recovery period. In other words, they became long-term changes.

Finally, other expansion plans made prior to the earthquake were advanced a year or more. The expanded port operation affected the water division as well as the fire department. The planning needed to extend water mains to the port industrial area for fire protection purposes was hastened.

Traffic engineering. -- The traffic engineering division employed only nine persons at the time of the disaster. In October 1964, traffic engineering was taken out of public works and made into a separate department. The traffic engineer was retained as head of the new unit and reported to the city manager.

Traffic engineering had an increased work load following the disaster. Because of damage to streets and the downtown area, a considerable redevelopment program was required. For example, the department had to establish new traffic patterns as well as a new public parking program in conjunction with the rehabilitation of downtown Anchorage. Although city officials attributed traffic engineering's new status to the expanded program, it seems that other factors were also very important.

Prior to the disaster the public works director and his assistant had allowed traffic engineering to function fairly autonomously. The rationale was that here was a highly specialized function which should be administered primarily by those who had the proper training -- the traffic engineer and his associates. However, it is evident that more was involved. The two key public works officials often did not have time for overall departmental matters, including the close supervision of traffic engineering.

Because of traffic engineering's considerable autonomy, its officials were encouraged to seek official separation from public works. Thus there was pressure for a change in the status of traffic engineering even before

the earthquake. This strain became manifest as an unofficial policy which was pursued even more vigorously during the uncertain days following the disaster. Members of the division systematically disregarded the organization's official lines of authority by going directly to the city manager on important matters and bypassing the public works heads. This was done in hopes of demonstrating that the division could operate at the departmental level in the municipal structure. This strategy of the traffic engineering section, along with its expanded program following the earthquake, eventually led to its new status as a separate department.

Building inspection. -- Another disaster related structural change was the separation of the building inspection division from the public works department in October 1964. Like traffic engineering, the new department was elevated to the same level in the municipal structure as public works.

Prior to the disaster, many city officials did not consider building inspection an important function. This was partly reflected in the fact that the division, with ten employees, was understaffed considering the work to be done. The extensive earthquake damage to buildings and the subsequent rebuilding was responsible for heightened interest in the division and its function. One high city official noted for example, "We will make sure in the future that we have fully adequate inspection of all buildings."

Two additional building inspectors were hired in June 1964. Requests for increases in the staff had been turned down by city council prior to the disaster. This increase in size and the new departmental status were based on the increased post-disaster work load and an anticipated generally expanded operation.

More attention was paid to building and construction standards after the earthquake. To encourage the construction of earthquake-resistant buildings, a code committee composed of the head of building inspection and a number of local architects and engineers was organized. The committee wrote a number of amendments to the community's building codes, which reflected the earthquake experience. The amendments were adopted in April 1965.

Engineering division. -- Prior to the earthquake, public works officials had considered establishing a position to coordinate the underground construction activities of public and private agencies. It would serve as a clearing-house for the scheduling of the agencies' construction work and for the location of utility lines. The need had apparently existed for some time, but nothing had been done about it.

Also needed was information about new construction, in the form of utility drawings, which could be stored in a centralized location. Public works had utility drawings of community facilities but they were not up to date because of budgetary considerations. Those available proved invaluable for reconstruction work done on city utility lines after the earthquake. The large amount of repair and improvement of underground utility lines done by public works and other organizations made it even more important that someone

coordinate and make a record of new construction. City and public works officials felt that if these functions were carried out a considerable savings in project costs would be made over the long run.

As a result, in late 1964 a new position called "projects control engineer" was added to the public works' engineering division. A draftsman was also added to work on utility drawings.

These changes were an adaptation on the part of the engineering division to problems that persisted from the pre-disaster period. It seems that the changes were made when they were because the problems they were expected to correct had assumed greater proportions due to earthquake related reconstruction activity.

The earthquake was also indirectly responsible for several departmental personnel changes on the administrative level and in the engineering division. Some occurred because a few persons were offered what they considered to be more attractive positions. These changes precipitated others in the organization.

In the summer of 1964, the assistant director left the department for a position with a state agency. The position he assumed had been established because the agency was involved in much earthquake related reconstruction work. In one sense, the assistant director owed his new position to the disaster.

The new assistant public works director being from the department's engineering division, resulted in some personnel changes within that division. One man resigned, partly because before the disaster he had had his differences with the new assistant director and thus chose not to work under him. Also, the data show that a second man resigned when the new assistant director passed over him in selecting a successor to fill his vacated position.

Finally, in July 1965, the public works director resigned and joined an engineering firm engaged in reconstruction work on city facilities. As director he had often been in contact with personnel from this firm so he was in an advantageous position to learn of its employment opportunities. Had it not been for the disaster, such an opportunity would not have been available. The firm was in Anchorage to serve as consultant to the Corps of Engineers on rehabilitation work. When the director resigned, the man who had been the assistant director during the emergency returned as his successor.

It is possible that similar changes in personnel, as noted here, might have come about even without the earthquake. There is a high rate of turnover in personnel in most organizations in Anchorage anyway. But, these particular changes happened when they did at least in part because of post-disaster circumstances, which provided the opportunity at a specific point in time.

Finally, although personnel changes are not long-term changes as earlier defined, new personnel can bring about such changes. This is true to the extent that new and old job holders perform their duties differently and also to the degree that interpersonal patterns are modified by changes in personnel.

Building construction and maintenance. -- Prior to 1963, responsibility for the maintenance of city-owned buildings and for related functions was divided among several city departments. The department using a building had to take care of it, which usually meant breakdown rather than preventive maintenance was practiced. In late 1962, when engineering division personnel repaired and remodeled some city buildings, the inadequacy of the maintenance program became apparent to public works and other city officials.

In 1963, the city let several contracts for architectural work. A public works engineer administered the contracts and coordinated the work. Also during this period, other city departments asked engineering personnel for building design and estimating work. These developments emphasized the need to establish a permanent group to take care of city buildings.

Thus, the building repair and maintenance section was unofficially created in the engineering department. It became official when city council gave approval early in 1964. The section had seven employees.

Building construction's assigned responsibilities were: (1) to provide a planned preventive maintenance program for the eighty-six city buildings, thus reducing costs over the long run; (2) to supervise and coordinate architectural firms doing work for the city; and (3) to do design work for municipal buildings.

Like the heads of several public works divisions, the building construction officials enjoyed considerable autonomy. The public works director and his assistant concentrated most of their efforts on other sections of the engineering division, and did not often encourage building construction personnel to seek their approval before making a decision.

Partly because of this, decisions were made which technically should have been cleared first by the director or his assistant. Understandably, this sometimes led to decisions and activities that they would not have approved. In the pattern which evolved, a head official of building construction first engaged the section in some project, and then sought the support of those in higher authority. For the sake of anonymity we shall refer to this official by the fictitious name of "Mr. Brown."

As in any organization, Mr. Brown was expected to follow certain rules and procedures in making decisions and in engaging in activities -- even those which did not need the sanction of higher authority. However, he tended to use unofficial means and methods. Because of this tendency and encouraged by the frequent inaccessibility of his immediate superiors, Mr. Brown often went beyond his authority. This sometimes got him into trouble. For example,

at times he made certain decisions which required the expenditure of large sums of money before such money was available to him.

During the disaster, Mr. Brown organized the previously mentioned Disaster Control Group. His method of operation, and that of regular employees and volunteers who followed his lead during the emergency period, was generally a continuation of the unofficial patterns that evolved before the disaster. Our interview data indicate that this was at least true in terms of this group's orientation towards established rules and regulations. For example, one member who participated in the emergency rescue and relief activities commented as follows:

We commandeered all the equipment we needed, all the material we needed, and we just did the job. That was a projection of what we normally do. We do these sort of underhanded things normally, but we don't do them so flagrantly as we did then.

Mr. Brown and his group were quick to make decisions and to respond to problems and needs during the emergency period. This, too, was an extension of normal behavior. It was the consensus among city officials that his emergency group did an outstanding job.

Prior to the disaster, officials tended to perceive the building construction section's methods as dysfunctional for the public works department and the larger municipal organization. In terms of our conceptualization, this was a source of strain.

However, similar activities during the disaster tended to be defined at the time as functional. Put in a more general sense, a modus operandi which was seen as creating instability under relatively normal conditions was defined as functional under emergency conditions when adaptive rather than routine behavior seemed appropriate.

Some time after the disaster, Mr. Brown and his section were again perceived as creating problems because of the unit's manner of operating. Almost exactly one year after the disaster, for example, a high public works official made the following comment regarding this section:

You get in the problem there of people that are real good in a crisis and perform outstandingly because they have the initiative, but they don't work too well. They can't work continually that way because if they do, they will run over everybody.

This same official contrasted the above type of person with another:

Now you take a man like _____. He's worthless in a crisis, absolutely worthless. But on the long haul that's the kind of guy that the [city] council wants and that's the kind of guy you have to have.

The unorthodox fashion in which building construction and maintenance operated was primarily due to the leadership of Mr. Brown. This was recognized by public works and other city officials. Also, our data suggest that Mr. Brown's actions tended to follow more unofficial lines after the disaster due to (1) the increased preoccupation of his superiors with rehabilitation problems, and (2) the general fluidity which characterized the situation in which he and others had to operate.

Public works officials adapted to this source of strain by removing Mr. Brown from his position in June 1965. However, before this was done he initiated some interesting changes in his section which had implications for other city departments.

On October 1, 1964, the building construction and maintenance section became a separate division and was renamed the city structures division. It is not clear whether this change was somehow related to the disaster. Some of our respondents, for example, reported that they believed the change was made necessary because of an increased work load following the earthquake. Others reported that they did not feel such a relationship existed.

The disaster experience remained of interest to the city structures division long after the emergency period had passed. Many informal critiques were held to discuss the problems encountered and the actions taken, with a view toward ascertaining more satisfactory alternative adaptations. Such continued interest in the disaster experience seemed to have stemmed from two sources: (1) in the course of their work during the rehabilitation period, the men in the division were constantly faced with physical reminders of the earthquake, and (2) Mr. Brown, who was retained as a top official when the section was made a division, was militant regarding the matter of emergency preparedness.

During the course of these critiques, it was generally agreed that the problems experienced by their group and others during the emergency resulted from two factors. First, there was an absence of a disaster plan specifying the roles of key people so that a division of labor and coordination could have occurred more rapidly. Secondly, there was a lack of needed emergency equipment such as certain kinds of tools and radios. Mr. Brown decided to initiate a disaster and emergency preparedness program in his division which would take these problems into account.

To engage in such a project in a bureaucratic setting, it is usually necessary for officials of a unit to acquire the approval of those higher in authority, unless such a program is an assigned responsibility. Usually too, such approval will not be forthcoming if the project is considered the function of another unit of the organization or if the means to carry it out violates organizational norms. As noted above, Mr. Brown frequently used unofficial means of operating and this pattern persisted in his program for disaster preparedness for his division. Also, city officials tended to define disaster preparedness as a function of the civil defense department. Accordingly, this program met with resistance.

Mr. Brown and others in the division wanted to play a role in future emergencies similar to that which the division had played in the emergency period following the earthquake. They were encouraged to proceed with plans for such a role by the fact that months after the earthquake, an active civil defense program had not yet been established. City-structures personnel took the initiative and began functioning in this area as they had done during the emergency period. Some of their ideas were later adopted by other city departments.

One of the first steps taken was the acquisition of a considerable amount of equipment. One year after the disaster, for example, the division had acquired several additional radio equipped vehicles. Also, the men in the division were issued protective clothing such as hard hats and rain gear so they could do emergency work in all types of weather and situations. In addition, Mr. Brown asked the personnel to carry basic emergency tools in their vehicles -- e.g., cutting torches and wrecking bars -- in anticipation of emergency operations.

Much of city-structure's emergency equipment was acquired somewhat unofficially. For example, specific city funds were allocated for small tools, which usually meant wrenches, hammers, and the like. But the division bought cutting equipment, wrecking bars and similar pieces of equipment with such funds. Also, some equipment purchases were justified on the basis that it was needed for routine work with an eye toward using it primarily in emergencies.

As previously noted, much confusion occurred during the emergency period because persons who had disaster roles could not easily be identified. In anticipation of this problem in future emergencies, each city-structures employee was given an identification card. Their hard hats were prominently marked with the city of Anchorage emblem and a reflectorized emergency symbol. City police and firemen were acquainted with these cards and hats so that division personnel could pass police lines and enter emergency areas without difficulty. Also, vehicular identification plates were made.

A written emergency plan was also prepared for the division. In writing this plan, an effort was made to anticipate and make allowances for the kinds of situations and problems which occurred following the earthquake. The plan was not lengthy but covered several important areas: (1) emergency responsibilities of the division, (2) emergency communications, (3) the use of volunteers, (4) emergency lines of authority, and (5) reporting procedures. As it was written, the plan reflected the tendency of the division to emphasize the adaptation to situations in terms of expediency rather than established procedure.

Some key officials were opposed to city-structure's initiative regarding disaster planning and preparedness. They objected to statements such as the following that appeared in the disaster plan: "If you are turned back at a police post, try to get through another one. Use talk, trickery, or muscle if you have to, but get through."

Also, some felt that while city structure, like any city division, could be called upon in an emergency, it should not involve itself to such a degree in these matters. Emergencies, they reasoned, were primarily the concern of the police, fire, and civil defense departments. The latter was responsible for planning and preparation.

On January 23, 1965, the division was again engaged in an emergency operation. A major fire involving petroleum tanks occurred in the port area. City structure personnel were mobilized and appeared at the scene of the fire to generally assist city firemen. Some city officials thought they tended to get in the way somewhat because they had no special training.

Because of this experience and the belief by some that the division had exceeded its sphere of responsibility, city officials exerted some pressure on the CD department to do more toward establishing an interdepartmental disaster program. Civil defense officials were instructed to work with the various city departments whose personnel could be called upon during a disaster or emergency.

Interestingly, Mr. Brown was told to discontinue his "go it alone" activities and several of the ideas used in his division were incorporated into a proposed interdepartmental civil defense program. For example, in the following quotation from an interview with a high city official, the similarity can be noted between the proposed CD program he discusses and the one implemented earlier in the city structures division:

As we go along with this program these people will be provided with hard hats and with turn-out clothing such as volunteer firemen have, and certain vehicles. When they are responding, for example, to assist the firemen and police at a large conflagration, they will be able to go through police lines and get into the scene of the emergency to be useful. And also we will probably develop a new identification card system so that those persons who are specially talented to be helpful in such emergencies will have cards that identify them as emergency rescue persons.

Thus, based on our data, we conclude that Mr. Brown was defined as a disturbing influence not only by the public works department but by the general municipal organization as well. Officials in public works and in the city manager's office were concerned about his tendency to proceed in an unofficial and unorthodox fashion and to assume the functions assigned to another department.

Officials tried to neutralize this threat to stability by preempting Mr. Brown's disaster planning ideas and assigning civil defense to develop them on an interdepartmental basis. It was hoped that the initiative would be wrenched from Mr. Brown and thus his division would no longer need a separate disaster program. Mr. Brown, then, served as an impetus for change within the context of the disaster not only in public works but in the municipal organization in general. The final adaptation, as previously mentioned, was to ask Mr. Brown to resign because of his continuing policy of ignoring organizational norms.

To summarize, we have pointed out that disaster related long-term changes did occur in the public works department. Some changes were structural, such as when traffic engineering and building inspection became separate departments. Other modifications involved disaster planning, personnel, and physical facilities and systems. Our data also indicate that the earthquake functioned as a catalyst with regard to some changes. In addition, some changes evolved out of pre-disaster and disaster problems and sources of strain.

Organizations in Which No Observable Disaster
Related Long-term Change Occurred

Six organizations in our sample experienced no disaster related long-term change. That is, the disaster neither brought about conditions which initiated new patterns of change nor accelerated prior existing ones.

KHAR Radio

Pre-disaster Structure. -- KHAR was one of four AM stations in Anchorage. The staff of thirteen consisted of a manager, an assistant manager, several announcers, and sales and business office personnel.

KENI Radio and Television

Pre-disaster Structure. -- Anchorage stations KENI-AM and KENI-TV were owned and operated by the Midnight Sun Broadcasters, Inc. The corporation had several affiliated stations -- KFAR and KFAR-TV in Fairbanks, KINY and KINY-TV in Juneau, and KTKN in Ketchikan. The president and general manager was the head of the organization. Key positions at KENI-AM were operations manager, sales manager, two salesmen, copy writer, traffic manager and several announcers. The KENI-TV staff included an operations manager, a commercial copy writer, a news editor and a sales manager.

KFQD Radio

Pre-disaster Structure. -- Because KFQD was the most powerful Anchorage station, it was the official emergency broadcast station. The staff consisted of a general manager, a program director, a music director, a chief engineer, a news director, and several announcers. One announcer was the public information officer for the Anchorage Civil Defense Department.

Anchorage Telephone Department

Pre-disaster Structure. -- Unlike most American cities, Anchorage owned the telephone system and operated it as a city department. It was directed by a manager and employed 134 persons. There were 8 divisions: administration, traffic and equipment, construction, plant extension, commercial, sales and service, outside wire, and inside wire. Also there were four exchanges: Fairfax, Diamond, Federal, and Broadway.

At the beginning of 1964, the utility served 4,187 business and 12,919 residential lines. The system was operating at maximum capacity but could not keep pace with demands for new installations. Except for high priority requests the exchanges had been closed for new service since December 1963. Before the earthquake, the department was holding about 2,500 requests for service.

Emergency supplies were stockpiled at each exchange. A departmental disaster recall plan had been developed about a year and a half prior to the earthquake in anticipation of a possible nuclear emergency. In the plan, the exchange building to which an employee was to report was determined by where he lived. The recall procedure did not involve the use of the telephone system because previous experience suggested that it might not be very reliable. For example, during one period of the Cuban crisis the telephone load increased at such a rapid rate that it blew out the system's main fuses.

Presbyterian Community Hospital

Pre-disaster Structure. -- Presbyterian Hospital, which opened in June 1963, was founded by a nonprofit organization, the Presbyterian Ministries, Inc. The fifty-bed hospital leased its quarters in the basement, third, and fourth floors of the Anchorage Medical-Dental Building from a group of doctors who owned the building.

Many of the doctors whose offices were on the first two floors of the building sent patients to the hospital. Other local doctors also used the hospital's facilities. Presbyterian had no resident doctors.

During its short existence the hospital had experienced a series of financial crises. In December 1963, money problems forced a layoff of some personnel. Just prior to the earthquake, the hospital was operating at a deficit.

When the disaster struck, several key staff positions were occupied by new persons. The hospital administrator, hired about a month prior to the earthquake, was still in the process of becoming familiar with the operation of the hospital and with the community. The comptroller, who was being groomed to be assistant hospital administrator, had started work only a few

days beforehand. The director of nursing had been there only a few hours. Presbyterian did not have a disaster plan at the time of the earthquake.

Anchorage Independent School District

Pre-Disaster Structure. -- The district had about 16,350 students enrolled in its 20 elementary, 3 junior high, and 2 high schools. Its 7-man board of education established policy for operating procedures, staff, and finances. The superintendent of schools, who was the board's executive officer, was responsible for the system's operation.

The assistant superintendent for instructional services recruited and managed personnel and supervised the instructional program. The assistant superintendent for administrative services was responsible for building operation and maintenance, purchasing and supply, and so forth. The school principals and approximately 800 teachers were under the direct authority of the superintendent of schools.

The Absence of Disaster Related Long-term Change. -- A year and a half after the earthquake, some changes had occurred in these six organizations. However, as far as we were able to ascertain, none of them had any relationship to the disaster experience. For example, the Anchorage school district was in the process of implementing pre-disaster expansion plans as they had been conceived by officials before the earthquake. The Anchorage telephone department was also involved in carrying out a program conceived prior to the disaster. Some changes had occurred in Presbyterian Hospital, and in stations KHAR, KFQD, and KENI which appear to have no link to the disaster. Thus it seems that the March 27, 1964 earthquake had no lasting effect upon these organizations.

Summary of Findings

Our data indicate that a number of long-term changes were, in fact, precipitated by the earthquake in seventeen of the twenty-three organizations in our sample. Some of the changes were new organizational patterns, while others were preexisting patterns that were accelerated. Also, such changes stemmed from both internal and external sources. Finally, some of the changes have consequences for the day-to-day patterns of interaction of the organizations in which they appeared, while other changes were in the form of disaster plans and procedures and were thus intended to alter such patterns only during periods of emergency.

One of the objectives of this study was to explore the importance of organizational strain and interorganizational conflict in accounting for the relationship between the disaster and long-term organizational change. Whereas our findings indicate that the variable of organizational strain does

enable us to explain some of the long-term changes which occurred after the earthquake, this was not the case with interorganizational conflict even though several of the organizations in our sample experienced such conflict.

Following the disaster, for example, new conflicts arose between some organizations and old hostilities were heightened between others. These conflicts stemmed from disagreement over the proper emergency procedures to use; authority disputes; and heightened competition between some organizations which perceived the disaster as an opportunity to out-perform other organizations and thus enhance their own public image. It might be suggested that one of the reasons why there was no long-term change as a result of such conflicts is that they had not yet run their course by a year and a half after the disaster. There could, then, eventually be some resultant long-term social consequences.

In the next, and final, chapter we will put our findings into a more general framework.

NOTES: Chapter III

1. Martha Richardson Wilson, M.D., "Effect of the Alaska Earthquake on Functions of PHS Hospital," Public Health Reports 79, No. 10 (1964): 859.

CHAPTER IV

INTERPRETATION AND CONCLUSIONS

Disaster and Its Social Consequences

Many of the social consequences which unfold following a disaster are more or less short lived and are in response to problems and situations which are present during the immediate emergency period. For example, soon after the earthquake in Anchorage new and often unexpected organizational structures and relationships emerged. In addition, a number of organizations engaged in novel tasks and activities such as search and rescue. Of course, some organizations and groups were neither directly affected by the disaster nor experienced any significant social consequences during the emergency period.

This was true, too, for earthquake induced long-term social consequences -- some organizations experienced them, others did not. In general terms, the findings of this study point out that a disaster may (1) precipitate or set in motion new patterns or processes of long-term organizational change, (2) accelerate change already underway or more or less latent in an organization, (3) impede change that was in process or had been planned, and (4) have no perceptible long-term effect on an organization.

We might again ask why the earthquake had long-term consequences for some organizations; by answering that, we hope to shed light on the question of why so many organizations seemed not to undergo any long-term modifications. It was also found that in general very few organizations reported that the earthquake had significantly impeded the realization of pre-disaster plans for future growth and development. We will attempt to explain this pattern in view of the available data.

Internal and External Conditions Related to Long-term Organizational Change

As we observed in the first chapter, organizations are dilemma-solving social systems which must deal with both internal and external contingencies. In the most general sense, then, organizational change represents a reaction by an organization to external conditions or to internal characteristics and problems.

The data indicate that both disaster induced long-term organizational change and other instances of organizational modification can be accounted for in a similar fashion. The Alaska earthquake modified the environment and the internal patterns and characteristics of some organizations. As these organizations adapted to the altered conditions, the consequence was long-term change. Thus, it is not disaster per se which causes change but the conditions it creates for organizations.

The disaster experience influenced the development of two internal and two external conditions which provided the impetus for long-term organizational change in several organizations. The internal conditions were organizational strain and what we have labeled "organizational learning." The external conditions were increased environmental support and new environmental demands or requirements. These variables will be discussed below.

Internal Conditions: Organizational Learning

The Emergence of New Patterns of Change. -- As problem-solving entities, organizations incorporate into their structures and processes the knowledge and skills gained from encounters with various kinds of events and situations. Accordingly, unique events such as disasters offer organizations an opportunity to discover alternative modes of operating.

Following the earthquake, many organizations found it necessary to deal with a number of new contingencies. Some discovered that their operations were seriously handicapped because they lacked important resources such as mobile radios and auxiliary generators.

A number of long-term organizational changes were made in light of such experiences. Some procedures which proved satisfactory during the disaster became prescribed everyday methods. Also, some of the adjustments made during the emergency which proved functional for such situations were incorporated into organizational disaster plans. Further, some of the physical resources that were wanting following the disaster were later purchased and maintained as standby emergency mechanisms.

After the emergency period, considerable reflecting and second-guessing took place, particularly on the part of the personnel in organizations that played prominent disaster roles. A number of them wrote "after action" reports in which their disaster activities were described and in some cases evaluated with an eye toward making better preparations in the event of future disasters. Some organizations held formal meetings in which their emergency activities and problems were reviewed, while most had more or less informal critiques. Such introspection had some influence on the implementation of a number of new organizational patterns.

The new patterns of change which seem to be a consequence of organizations taking into account their disaster experiences are of several types. For example, some of the changes that occurred in the Alaska Disaster Office were structural. It was reorganized into two new sections; the assistant director and the operations officer were placed on the same authority level. This modification became a long-term organizational feature because it was believed to have been very functional during the earthquake emergency period. Another type of change took place in the Alaska Native Hospital, where some disaster plan revisions were made.

Several cases of long-term changes in physical resources occurred. The disaster experience demonstrated the need for a civil defense communications network which was subsequently established. Also, Providence Hospital had borrowed a pump and used an adjacent spring as an emergency source of water. Consequently, a pump was purchased so the spring could be used when needed. These examples should suffice, then, to demonstrate that the knowledge gained from the disaster experience by many organizations was transformed into new long-term organizational characteristics.

Acceleration of Preexisting Patterns of Change. -- A similar organizational learning process was involved in the acceleration of preexisting patterns of change in some organizations. The implementation of some pre-disaster patterns of change was catalyzed by the earthquake experience because it somehow demonstrated their importance for organizational viability. For example, the disaster experience offered further proof to the Alaska Disaster Office of the importance of written disaster plans. As a result, plans which were being worked on prior to the catastrophe, and which in some instances had been receiving only slight attention, were completed much sooner than they otherwise would have been. In like fashion, the disaster brought about an acceleration in plans to implement a technical change in the municipal light and power department's transmission system which would permit faster restoration in the event of outages. Thus, latent patterns of organizational change became more relevant because of the disaster experience.

Internal Conditions: Organizational Strain

The reaction of some organizations to a second type of internal pattern -- organizational strain -- also accounts for the emergence of some new disaster related long-term changes. Such changes arose from strain in the public works department, the Alaska Disaster Office, and the south central Alaska Red Cross chapter. Before the earthquake these strains were controlled, or at least more or less tolerated. However, the controls broke down following the disaster. This resulted in an intolerable amount of pressure being exerted for the removal of the strains. Let us briefly review our earlier discussion of such strains and the adaptations made to them in light of our more analytical discussion.

In the Anchorage public works department discussion, we indicated that "Mr. Brown's" inclination to utilize unofficial means to accomplish his projects was defined as a threat to the organization's stability. This strain was present prior to the disaster. Afterwards, Mr. Brown used unofficial channels even more, because his immediate superiors were preoccupied with rehabilitation problems. He also tried to establish a disaster preparedness program in his division -- a function that other city officials defined as a civil defense department prerogative. The initial adaptation to this divisive influence was the preemption of the disaster program by other city officials. Finally, Mr. Brown was forced to resign. Thus, two changes emerged from this source of strain. Disaster preparedness ideas initially implemented in Brown's

city-structures division were incorporated into local CD plans. Ultimately, the role incumbent was replaced.

The interview data also suggest that traffic engineering became a department separate from public works partially as a result of its unofficial policy of bypassing the public works heads. Through this policy, traffic engineering exerted pressure on city officials to change its status in the municipal structure. It appears that the disaster provided the opportunity for making official what was being done on an unofficial level. Thus, the argument could be presented to those who might have objected to the change, e.g., the heads of public works, that it was being done to maximize the handling of traffic engineering problems brought on by rehabilitation.

In the local Red Cross chapter, latent pre-disaster strain became manifest following the earthquake and resulted in some long-term change in the organization. Because of the disaster chairman's multiple organizational memberships he did not perform his expected role in the disaster. Therefore, the emergency response of the chapter was seriously curtailed. The adaptation to this strain involved the replacement of the role incumbent and the reorganization of the disaster committee -- including appointing a co-chairman as a back-up.

Finally, our data indicate that the inadequate role performance of the "plans officer" in the Alaska Disaster Office was a source of strain even prior to the disaster. This had been kept within limits mainly by not assigning him important duties. But during the emergency and rehabilitation periods this kind of control could not be maintained because everyone had to "pull his own weight" since there was so much to be accomplished. Thus, a different kind of adaptation had to be made, which was to replace the role incumbent.

External Conditions: New Demands

Emergence of New Patterns. -- In addition to responding to internal problems, organizations must also adjust to their environments. As external conditions are altered, organizations must, in turn, make certain adjustments. Otherwise, their very existence may be threatened over the long run. For a number of organizations, the earthquake introduced new environmental problems or demands. In the process of meeting them, new organizational patterns developed.

The expanded port operation created a new environmental problem for the Anchorage fire department -- increased fire hazard. To cope with this, a fire inspector was appointed and the port fire brigade was established.

Earthquake induced environmental changes were partly responsible for the expansion of building inspection and its new departmental status. Increased task demands and greater responsibility seemed to call for a larger staff and the added autonomy given by departmental status.

Acceleration of Preexisting Patterns of Change. -- Modified external conditions also led to the acceleration of a number of pre-disaster organizational patterns of change. Long-term changes programmed for the future were advanced a number of years either because they were perceived as immediately necessary or because it seemed that certain gains would be made in light of the altered environment.

Consider for a moment the latter situation. After the earthquake, port and city officials had to deal with new environmental conditions and relationships largely due to the neutralization of the competition usually offered by other major Alaskan ports. To take advantage of the absence of competition and to establish the port as the state's major water terminal, officials hastened to implement plans for expansion and development by several years and to reorganize the port department's staff.

Certain pre-disaster patterns of change were accelerated in the water division of the public works department because of their relevance to new external conditions. Officials reported that the division's move toward a status separate from public works was accelerated because of new demands such as the need to expand operations in the port area. Two new positions were created and the division was given more responsibility. Such changes had been planned prior to the earthquake, but the change in external circumstances made them necessary sooner than had been anticipated.

External Conditions: Increased Support

A number of new patterns of change emerged in some organizations because they were given increased outside support following the earthquake. For example, civil defense programs seemed, for a while anyway, more important than they had before. As a result, official bodies that allocate resources for civil defense, such as the Anchorage city council and the Alaska state legislature, became more generous.

This seemed to be the reason that the Anchorage city council not only approved the reappointment of the civil defense department director after the disaster but also ratified the appointment of an assistant director. Before the earthquake there had been some question whether the department would be even continued after the director resigned. Another indication of increased support was city council's creation of the civil defense disaster board.

Some Alaska Disaster Office changes can also be explained by the unusual amount of support it received after the disaster. It acquired more personnel and the legislature appropriated money for a new communication system.

In sum, the desire of some organizations for growth and expansion which had been stymied before the disaster, was realized afterwards because their bargaining positions were improved.

Infrequency of Retardation of Organizational Change

Theoretically, one of the most important consequences of any community disaster might be the retardation of change already in process. On numerous occasions, the destruction of important organizational resources by a disaster agent most certainly has been responsible for the abandonment of established plans for growth already in the process of being realized before such events happened. In these instances, such plans are often forgotten because the mere recovery or survival of the organization itself becomes a real challenge. However, in this study, the earthquake was clearly responsible for impeding important long-term ongoing change in only one organization: The Salvation Army had to postpone plans to organize a new center.

There appear to be two reasons why the earthquake did not generally inhibit changes that were underway. First, after a fairly short time, many organizations were able to control the amount of disruption experienced and to absorb the loss of resources. This was true of the Anchorage Natural Gas Corporation, among others. Although the disaster was a shock to such organizations, they were able to restore their equilibrium to a large degree and continue with pre-established programs and plans.

Secondly, many organizations that undoubtedly would have found it necessary to make significant modifications in their existing structures and in growth plans due to loss of resources, did not have to because new external sources of financial assistance were made available. This was particularly true of public organizations. For example, state and local agencies directly and indirectly benefitted from the extensive federal aid given to state and local governments, thus offsetting their lost resources. As previously noted, federal agencies provided millions of dollars in assistance.

The case of the Anchorage Independent School District is a good example. School officials had made plans prior to the disaster for adding personnel including a psychologist and a librarian. Shortly after the disaster, these additions were deleted from the coming year's budget. However, they were again restored when a special \$484,000 grant was given to the schools by the Ford Foundation in June 1964. The Office of Emergency Planning provided even greater assistance. It spent funds amounting to millions of dollars for the reconstruction and rehabilitation of damaged Anchorage facilities.

The Absence of More Long-term Change

When the magnitude of the earthquake is taken into account, it is somewhat surprising to note the limited extent of actual long term changes initiated by it. While some organizations did experience significant change, a large number underwent few or only minor long-term adjustments. However, our research was completed a year and a half after the disaster -- fairly early as far as longitudinal studies go; more changes may yet appear.

The question that comes to mind, though, is why more disaster initiated long-term changes did not appear a year and a half after the earthquake. It is no less difficult to account for the absence of change than to account for its presence. Nevertheless, we shall make some attempt to answer this question in light of the available data. Two factors seem to account, in part, for the absence of a greater amount of long-term organizational change.

Absence of Significant Environmental and Internal Impact

First, it seems that a number of organizations experienced little or no long-term change because -- except for the brief emergency period -- the disaster did not appreciably alter their relationship to their environment, nor significantly affect their internal patterns. This was true, for example, of the Anchorage Daily Times, the Anchorage telephone department, and station KENI. By and large, once the initial emergency was over, these organizations did not find it necessary to adapt on a long-term basis to a new set of external or internal conditions.

Low Priority of Needed Changes

Also, certain long-term changes that were perceived as desirable by some organizations were not made because they were of low priority vis-a-vis other considerations. Organizations must allocate their resources among a number of concerns. Usually high priority items override low priority ones. Accordingly, in some organizations needed changes were not made because such changes were treated as secondary to other problems. Some organizations, for example, had not written disaster plans because they were unwilling to divert their members from more immediately pressing tasks. Also, many organizations were unwilling to allocate funds for emergency equipment if other needs would have to be set aside.

Presbyterian Hospital represents an extreme case where overriding priorities interfered with the implementation of needed long-term changes. The serious financial situation the hospital was in had not improved a year and a half later. In some respects, it had become more acute. Thus, little was done with regard to disaster preparedness because the most pressing concern was the very survival of the organization itself.

Concluding Observations

This study provides additional evidence to support the proposition that durable social systemic change may grow out of circumstances created by natural disaster. There are also some other general implications of this study.

First, this study underscores the necessity of considering both internal and environmental variables when conducting research on social systemic change. Again our data indicate that the disaster facilitated long-term organizational change through its impact on both the internal patterns and environmental situations of organizations.

Some of the organizations in our study experienced long-term change because internal strains evolved after the earthquake or because preexisting ones were heightened by it. Yet organizations and other social systems do not exist in isolation. They function in an environment composed of both social and physical elements. Such elements were important in accounting for organizational change in this study. Our findings show, for example, that the receipt of outside support following the disaster enabled some organizations to make certain changes and enabled others to maintain previously existing levels of growth and development.

Second, this study once again points out the interdependent nature of elements in social systems like the community. Our findings indicate, for example, that in some cases Anchorage organizations were required to undergo long-term change following the earthquake in response to changes in other community organizations. This sometimes occurred when Anchorage organizations were closely interrelated as in the case of government organizations.

Finally, this study further indicates the strong continuity in human social organization. Even though the earthquake was very disruptive in both a physical and a social sense, community organizations were not changed to the degree that they were hardly recognizable a year and a half later. There was considerable continuity between pre-disaster and post-disaster organizational patterns. Many of the long-term changes, rather than being new forms, were pre-disaster trends that were accelerated by the earthquake. Mention has also been made of the infrequency with which previously existing plans for change were abandoned by organizations. It seems that the main efforts of many organizations were directed at re-establishing disrupted patterns. This study indicates, then, that organizational behavior following the Alaska earthquake was aimed at the maintenance of certain preexisting patterns as well as bringing about long-term change.

APPENDIX

METHODOLOGY

The Disaster Research Center studied the organizational response to the March 27, 1964 earthquake, focusing on the immediate emergency period.¹ The present study is a continuation and elaboration of the initial research effort. Consequently, the methodologies of the two studies are inextricably bound and we will discuss aspects of both.

Selection of the Disaster and Organizational Units

A five-man DRC field team arrived in Anchorage during the night of March 28. Elements of this group remained in Anchorage for a week to interview various organizational officials and to collect other kinds of data. Second and third field trips were made in May and June 1964 to complete the data gathering on the initial research problem and to conduct intensive interviews in two organizations. On three final field trips, information on long-term organizational change -- the subject of the present study -- was collected. These trips were made in August 1964, and in March and August 1965. Thus, the data gathering period for this study was a year and a half.

There were several reasons why this particular disaster was chosen for study and why the focus was on the greater Anchorage area rather than on the other affected Alaska communities. First, the general research design called for giving priority to natural disasters that met the following criteria: (1) the impact of the disaster agent was sudden and unanticipated, (2) it resulted in a considerable loss of life and property, (3) it occurred in a metropolitan area, and (4) it caused considerable disruption to normal community processes.

It was anticipated that such a disaster would result in numerous contingencies and thus make it possible for the researcher to observe the development of emergency structures and processes in the community. The research plan gave high priority to disasters which occurred in large communities because of the likelihood of the presence of a variety of organizations and groups that could be studied. The earthquake met most of the established criteria, including the fact that Anchorage was by far the largest of the affected communities.

In DRC studies, organizations are usually the primary units of analysis for two reasons. First, there is a dearth of information on organizational functioning in disaster. Second, the crucial roles which many organizations play during periods of community disaster warrant more systematic study. Thus, a number of organizations in Anchorage representing both local and state levels were selected for analysis.

The initial research effort was oriented toward acquiring answers to the following questions from each organization included in the study: (1) What was the organization like prior to the disaster? That is, what were its internal characteristics such as size, authority and decision-making patterns, and activities? (2) What was the nature of its relationship with other organizations? (3) What were the organization's major activities during the emergency period? Also, disaster-created problems and adaptations were noted. And finally, (4) what was the nature of the organization's involvement with other organizations and groups during the emergency period? Attention was given to instances of interorganizational cooperation and conflict.

Thus, information about the organizations' pre-disaster structures and functions was acquired to provide a context from which to view their emergency response. This data enabled us to subsequently determine the extent and significance of the organizations' emergency adjustments. Information about the intra- and interorganizational structures and functions during the emergency period was collected. The emergency period was defined as the first three days following the disaster when the greatest demands were placed on the community's resources.

The sample for the first study was drawn from the Anchorage organizations involved in the emergency community response. Initially, the organizations studied were those most actively involved in the emergency, thus permitting the researchers to reconstruct the general pattern of the organized community response. Later the research was expanded to include organizations not as actively involved but which exhibited some interesting patterns or problems. Therefore, a purposive rather than probability sample was drawn.

The need for flexibility in selecting organizations for the initial study cannot be overemphasized. In a probability sample, many organizations with vital disaster roles would have been left out leaving us with an incomplete understanding of the organized community response. Several methods were used to identify the organizations to be included in the sample. Direct observation of some organizations involved in emergency activities was possible. For example, soon after reaching Anchorage, the field team went to the two principal emergency coordinating centers and here officials of some of the most important organizations were identified. When these officials were interviewed, they frequently mentioned other groups that should be contacted. Also, in a few instances, persons from organizations that the researchers knew little about approached them and volunteered information.

Of the twenty-three organizations selected for the present study, all but two were part of the initial study. Thus, for most of the organizations base-line data from which the presence or absence of long-term change could be measured had already been collected, as well as data on their emergency responses which might be related to any long-term change they experienced. The primary task remaining in the second study was the acquisition of information on the long-term patterns and changes in these organizations. A broadcasting company and a daily newspaper were the organizations added to

the second study; the former was added because it was experiencing an interesting change, the latter because its inclusion rounded out the kinds of organizations considered.

Sources of Data

Several sources of data were utilized in both studies. They were: (1) unstructured and semi-structured interviews with organization members, (2) on-the-scene and partially tape-recorded observations of organizations in operation during the emergency period, and (3) various kinds of organizational documents. The interview data were the most important for this study; other sources were used as supporting information.

Interviews

The basis for choosing respondents was the same in both studies. The field team tried to interview persons at more than one level in an organization, at somewhat corresponding positions in the various organizations, and those persons thought to be most familiar with a given situation or event as it affected their organization.

Except for two organizations which were later analyzed in depth the interviews conducted during the first study were relatively unstructured. The interview guide briefly outlined topics to be covered and the logical point at which such topics could be introduced. It was felt that this approach would maximize the opportunity for acquiring rich descriptive accounts from respondents, and to a considerable degree it did.

The interviewer guided the respondent, determined the tone of the interview, structured questions as it progressed, and probed for information about key events and problems. These interviews varied from one-half hour to two hours in length.

Because they were highly involved in the emergency response, the Anchorage public works department and the Alaska Disaster Office were subjected to more comprehensive analysis. Members of these organizations were interviewed in depth and a more structured interview guide with open-end questions was used. More persons were interviewed in these two organizations than in the others. The interviews lasted from one and a half to three hours.

The guide for the organizational change study had a series of open-end questions aimed at eliciting information about both intra- and interorganizational change. Because the research problem was more specific, the interviews

were somewhat more structured. Long-term organizational change was sought in the following areas:

- I. Intraorganizational change
 - A. Structural -- creation of new positions or units, changes in lines of authority, decision making, etc.
 - B. Personnel -- general increase or decrease
 - C. Function -- change in what the organization does, i.e., its activities
 - D. Disaster planning -- development of disaster plans or revision of old plans
 - E. Technical-physical -- development of disaster warning facilities, change in supplies and material available, etc.
- II. Interorganizational change
 - A. External relationships -- change in the nature of involvement with other organizations, e.g., closer ties, or emergence of conflict relations
 - B. Points of communication -- creation of interorganizational liaison positions and committees
 - C. Technical -- creation of new technical systems to facilitate communications, etc.

These areas were considered because the work of other social scientists and our own disaster research experience suggested that change might occur in these dimensions. Several general questions were also included to enable us to get data on change which did not fit into one of these specific areas. Further, interviewers were responsible for probing and asking respondents why they thought a change in a given area was related to the disaster experience or, in the absence of change, why none occurred. After field trips four and five, some questions were added and a few unnecessary ones omitted from the interview guide.

The long-term change interviews varied from one-half to two hours in length. During the three field trips, ninety-four of these interviews were conducted. Because of the relatively unstructured nature of the interviews, they were tape recorded and typed verbatim before being analyzed. The vast majority of respondents did not seem to be inhibited by the use of the tape recorder. Only a few persons said they preferred to be interviewed without it. In some instances when interviewees were asked to talk about conflicts or other problems they requested that such remarks not be taped; however, they did not object to having their comments recorded by hand. Most respondents seemed willing to discuss rather sensitive areas with little hesitation. The field team members assured each respondent that his anonymity would be maintained and, evidently, this assurance neutralized any threat perceived in the situation. Organizational officials in Anchorage were highly cooperative throughout all phases of the research.

Non-participant Observation

Direct observation of organizational activities was another source of data used in both studies. Because DRC field team members arrived in Anchorage during the emergency period, they observed emergency operations as they occurred and in some instances even when they were being organized. Thus, in some cases, less reliance had to be placed on reconstructive interviews. Team members were present at the principal emergency coordinating centers and attended organizational and city council meetings. In a few instances, e.g., some city council meetings, the proceedings were tape recorded. Usually the field team members took handwritten notes.

The fact that field team members were able to observe emergency organizational processes, conflicts, and other problems underscores the importance of rapidly dispatching researchers to the disaster scene. Such observations not only serve as a check on the reports by respondents, but tend to make the research less sterile for the investigators.

Non-participant observation was also used on the field trips which dealt more specifically with long-term organizational change. For example, on the last field trip a year and a half after the disaster, the author attended certain organizational meetings because they had a bearing on the research problem.

Documents

Various kinds of documents were the final source of data for both studies. The following were the major types of such material used: (1) During the course of data gathering, organizational officials were asked for minutes of meetings, policy statements, disaster plans, communication logs, after-action reports, budgets, and recorded messages of various kinds. As a result, an extensive body of such data was acquired. (2) Several tape recorded radio broadcasts made during the emergency and rehabilitation periods following the disaster were acquired. (3) Finally, numerous newspaper accounts were used as supplementary data. One Anchorage newspaper was subscribed to from the time of the initial emergency throughout the rehabilitation period.

NOTES: Appendix

1. The findings of this study are reported in Daniel Yutzy with William A. Anderson and Russell R. Dynes, Community Priorities in the Anchorage, Alaska Earthquake, 1964, Disaster Research Center Monograph Series (Columbus: Disaster Research Center, The Ohio State University, 1969).

Disaster and Organizational Change: A Study of the Long-Term Consequences in Anchorage of the 1964 Alaska Earthquake. Unclassified. Disaster Research Center, The Ohio State University, Contract OCD-PS-64-46, Work Unit 2651A, September 1969, 89 pp.

This monograph discusses the findings of a year and a half field study on the long-term effects of the March 27, 1964 Alaska earthquake on a sample of twenty-three organizations. Seventeen of the organizations experienced some long-term change as a result of the earthquake. In some the disaster facilitated the emergence of new patterns of change; in others it accelerated preexisting trends. Organizations tended to undergo long-term change when the earthquake significantly altered their environments, for example, by creating new demands, and when it engendered or heightened internal problems such as organizational strains.

Disaster and Organizational Change: A Study of the Long-Term Consequences in Anchorage of the 1964 Alaska Earthquake. Unclassified. Disaster Research Center, The Ohio State University, Contract OCD-PS-64-46, Work Unit 2651A, September 1969, 89 pp.

This monograph discusses the findings of a year and a half field study on the long-term effects of the March 27, 1964 Alaska earthquake on a sample of twenty-three organizations. Seventeen of the organizations experienced some long-term change as a result of the earthquake. In some the disaster facilitated the emergence of new patterns of change; in others it accelerated preexisting trends. Organizations tended to undergo long-term change when the earthquake significantly altered their environments, for example, by creating new demands, and when it engendered or heightened internal problems such as organizational strains.

Disaster and Organizational Change: A Study of the Long-Term Consequences in Anchorage of the 1964 Alaska Earthquake. Unclassified. Disaster Research Center, The Ohio State University, Contract OCD-PS-64-46, Work Unit 2651A, September 1969, 89 pp.

This monograph discusses the findings of a year and a half field study on the long-term effects of the March 27, 1964 Alaska earthquake on a sample of twenty-three organizations. Seventeen of the organizations experienced some long-term change as a result of the earthquake. In some the disaster facilitated the emergence of new patterns of change; in others it accelerated preexisting trends. Organizations tended to undergo long-term change when the earthquake significantly altered their environments, for example, by creating new demands, and when it engendered or heightened internal problems such as organizational strains.

Disaster and Organizational Change: A Study of the Long-Term Consequences in Anchorage of the 1964 Alaska Earthquake. Unclassified. Disaster Research Center, The Ohio State University, Contract OCD-PS-64-46, Work Unit 2651A, September 1969, 89 pp.

This monograph discusses the findings of a year and a half field study on the long-term effects of the March 27, 1964 Alaska earthquake on a sample of twenty-three organizations. Seventeen of the organizations experienced some long-term change as a result of the earthquake. In some the disaster facilitated the emergence of new patterns of change; in others it accelerated preexisting trends. Organizations tended to undergo long-term change when the earthquake significantly altered their environments, for example, by creating new demands, and when it engendered or heightened internal problems such as organizational strains.

Unclassified

Security Classification

DOCUMENT CONTROL DATA - R & D		
<i>(Security classification of title, body of abstract and indexing information must be entered when the overall report is classified)</i>		
1. ORIGINATING ACTIVITY (Corporate author) Disaster Research Center Department of Sociology The Ohio State University, Columbus, Ohio		2a. REPORT SECURITY CLASSIFICATION Unclassified
		2b. GROUP N/A
3. REPORT TITLE Disaster and Organizational Change: A Study of the Long-Term Consequences in Anchorage of the 1964 Alaska Earthquake		
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) One of a Series		
5. AUTHOR(S) (First name, middle initial, last name) Anderson, William A.		
6. REPORT DATE September 1969	7a. TOTAL NO. OF PAGES 89	7b. NO. OF REFS 41
8a. CONTRACT OR GRANT NO. OCD-PS-64-46	9a. ORIGINATOR'S REPORT NUMBER(S) Monograph Series #6	
b. PROJECT NO. Work Unit 2651-A	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)	
c.		
d.		
10. DISTRIBUTION STATEMENT This document has been approved for public release and sale; its distribution is unlimited.		
11. SUPPLEMENTARY NOTES This monograph is number 6 in the Disaster Research Center Monograph Series.		12. SPONSORING MILITARY ACTIVITY Office of Civil Defense Office of the Secretary of the Army Washington, D.C. 20310
13. ABSTRACT This monograph discusses the findings of a year and a half field study on the long-term effects of the March 27, 1964 Alaska earthquake on a sample of twenty-three Anchorage organizations. Seventeen of the organizations studied experienced some long-term change as a result of the earthquake. In some cases the disaster facilitated the emergence of new patterns of change and in others it accelerated preexisting trends. Organizations tended to undergo long-term change when the earthquake significantly altered their environments, for example, by creating new demands, and when it engendered or heightened internal problems such as organizational strains.		

DD FORM 1473
NOV 64

Unclassified

Security Classification

14.	KEY WORDS	LINK A		LINK B		LINK C	
		ROLE	WT	ROLE	WT	ROLE	WT
	Sociology of Disasters						
	Disaster Research						
	Complex Organizations						
	Organizational Change						
	Organizational Learning						
	Earthquakes						
	Organizational Strain						
	Organizational Conflict						

THE DISASTER RESEARCH CENTER

The Disaster Research Center (DRC), a part of the Department of Sociology at The Ohio State University, was organized in 1963. The Center is engaged in the scientific study of individual, group, organizational, and societal responses to community-wide disasters and other extreme stress situations. Major focus of the research is placed on obtaining an extensive and detailed picture of the human and social problems generated by these events, and how they are solved by affected persons, communities, and societies. The Center conducts field studies both in this country and overseas. Part of the research of the Center also involves the laboratory study of groups under stress.

DRC STAFF

Co-Directors

RUSSELL R. DYNES

E. L. QUARANTELLI

Field Director

WILLIAM A. ANDERSON

Laboratory Director

ROBERT ROTH

Research Assistants

DAVID ADAMS

J. MICHAEL BROOKS

JOHN BROUILLETTE

ROBERT DAY

THOMAS FORREST

GARY KREPS

BENJAMIN MCLUCKIE

JAMES ROSS

ROBERT STALLINGS

STEPHEN VARGO

JACK WELLER

DENNIS WENGER

Fellow

ARNOLD PARR

Administrative Assistant

BARBARA TOOTLE

Secretaries

MARTHA CARR

JUNE REED